SLAG DISPOSAL
SITE INVESTIGATION
AT
ALGOMA STEEL CORP.,
VOLUME II

MARCH 1992

Ontario
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ALGOMA STEEL CORPORATION

VOLUME II

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Ontario Ministry Of The Environment

Report Prepared By:

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APPENDIX 5

Water Level Data

WATER LEVEL DATA

Appendix 5: Water Level Data

Well ID	Top Casing Elev. (m)	Stick up (m)	880805/06 development Water Levels (mbtc)	(masl)	880807 development Water Levels (mbtc)	(masl)	880808 development Water Levels (mbtc)	(masl)	880809/10 development/ sampling Water Levels (mbtc)	(masl)
A1-1	193.32	0.94								
A1-2	193.30	0.90								
A2-1	193.62	0.92			5.800	187.82	10.47	183.15	7.310	186.31
A2-2	193.46	0.78			6.465	187.00	6.480	186.98	6.420	187.04
A3	186.45	0.79								
A4-1	186.10	0.80								
A4-2	186.28	0.84								
A5	187.84	0.86			3.260	184.58	3.290	184.55	3.200	184.64
A6	187.90	0.81			1.850	186.05	1.870	186.03	1.820	186.08
A7-1	188.18	0.95								
A7-2	187.87	1.20								
B1	185.38	0.93								
B2-1	186.30	0.84								
B2-2	186.45	0.88								
B2-3	186.23									
B3	185.83	0.97								
B4-1	186.99	0.81								
B4-2	186.84	0.89								
B5	186.67	0.92								
C1	193.83	0.86	7.720	186.11	7.820	186.01	7.790	186.04	7.790	186.04
C2-1	195.41	0.81	6.130	189.28	7.052	188.36	6.825	188.585	6.760	188.65
C2-2	195.42	0.77	Dry		Dry		Dry		Dry	
C3	197.20	0.88	7.140	190.06	7.137	190.06	7.150	190.05	7.100	190.10
C4	189.14	1.00	4.085	185.06	4.125	185.02	4.095	185.045	4.060	185.08
D1-1	186.58	0.81	3.550	183.03	3.466	183.11	3.455	183.125	3.450	183.13
D1-2	186.69	0.87	3.670	183.02	3.657	183.03	3.625	183.065	3.640	183.05
D2	186.61	0.80	4.220	182.39	4.155	182.46	4.185	182.425	4.130	182.48
D3-1	185.82	0.82	2.620	183.20	3.530	182.29	3.150	182.67	2.800	183.02
D3-2	185.70	0.88	2.750	182.95	2.750	182.95	2.750	182.95	2.690	183.01
D4	186.33	1.15	3.260	183.07	3.345	182.99	3.335	182.995	3.290	183.04
D5-1	186.68	0.84	3.160	183.52	3.220	183.46	3.205	183.475	3.120	183.56
D5-2	186.69	0.91	3.280	183.41	3.275	183.42	3.305	183.385	3.250	183.44
D6	190.97	0.83	5.125	185.85	5.310	185.66	5.150	185.82	5.080	185.89
SG-1	183.84									
SG-2	183.97									
SG-3	183.93									
SG-4	184.41									
SG-5	193.89									
DOMTAR	185.32									
GEOCON 1B	186.60									
GEOCON 1A	186.50									
GEOCON 3	186.91									
GEOCON 4A	190.42									
GEOCON 4B	190.20									
GEOCON 5	189.33									
GEOCON 7	189.72									
GEOCON 9A	191.53									
GEOCON 9B	191.37									
GEOCON 10	193.84									
GEOCON 11	204.82									

mbtc - metres below top of casing
masl - metres above sea level

Appendix 5: Water Level Data

Well ID	Top Casing Elev. (m)	Stick up (m)	880829 and 30 sampling Water Levels (mbtc)	(masl)	881004 water levels only Water Levels (mbtc)	(masl)	881116 to 21 sampling Water Levels (mbtc)	(masl)	881203 water levels only Water Levels (mbtc)	(masl)
A1-1	193.32	0.94	6.760	186.56	6.655	186.67	6.350	186.97	6.375	186.95
A1-2	193.30	0.90	6.700	186.60	6.600	186.70	6.310	186.99	6.330	186.97
A2-1	193.62	0.92			5.480	188.14	5.430	188.19	not located	
A2-2	193.46	0.78			6.260	187.20	6.270	187.19	not located	
A3	186.45	0.79	0.895	185.56	0.340	186.11	0.610	185.84	0.670	185.78
A4-1	186.10	0.80	0.855	185.25	0.820	185.28	0.060	186.04	0.755	185.35
A4-2	186.28	0.84	1.254	185.03	1.845	184.44	1.185	185.10	1.205	185.08
A5	187.84	0.86			3.130	184.71	3.085	184.76	3.115	184.73
A6	187.90	0.81			1.355	186.55	1.190	186.71	1.330	186.57
A7-1	188.18	0.95	0.870	187.31	0.190	187.99	0.670	187.51	1.285	186.90
A7-2	187.87	1.20	1.910	185.96	1.695	186.18	1.345	186.53	1.300	186.57
B1	185.38	0.93	2.080	183.30	2.090	183.29	1.930	183.45	1.770	183.61
B2-1	186.30	0.84	1.620	184.68	1.620	184.68	1.530	184.77	1.745	184.56
B2-2	186.45	0.88	2.655	183.80	2.650	183.80	2.355	184.10	2.405	184.05
B2-3	186.23						2.070		1.675	
B3	185.83	0.97	2.660	183.17	2.625	183.21	2.480	183.35	2.305	183.53
B4-1	186.99	0.81	3.070	183.92	3.105	183.89	3.040	183.95	2.970	184.02
B4-2	186.84	0.89	3.600	183.24	3.675	183.17	3.540	183.30	3.455	183.39
B5	186.67	0.92	3.430	183.24	3.505	183.17	3.385	183.29	3.295	183.38
C1	193.83	0.86			7.750	186.08	7.740	186.09	7.730	186.10
C2-1	195.41	0.81			6.735	188.68	6.730	188.68	6.700	188.71
C2-2	195.42	0.77			Dry		Dry		Dry	
C3	197.20	0.88			7.030	190.17	7.005	190.20	7.010	190.19
C4	189.14	1.00			3.830	185.31	6.200*	suspect	2.610	186.53
D1-1	186.58	0.81			3.310	183.27	2.985	183.60	3.125	183.46
D1-2	186.69	0.87			3.505	183.19	3.180	183.51	3.235	183.46
D2	186.61	0.80			3.405	183.21	3.430	183.18	3.240	183.37
D3-1	185.82	0.82			2.410	183.41	2.455	183.37	2.460	183.36
D3-2	185.70	0.88			2.565	183.14	2.280	183.42	2.385	183.32
D4	186.33	1.15			3.150	183.18	3.180	183.15	2.950	183.38
D5-1	186.68	0.84			3.030	183.65	2.880	183.80	2.930	183.75
D5-2	186.69	0.91			3.160	183.53	3.145	183.55	3.055	183.64
D6	190.97	0.83			4.350	186.62	4.055	186.92	4.630	186.34
SG-1	183.84				0.274	183.57	0.250	183.59	not located	
SG-2	183.97				0.306	183.66	0.452	183.52	0.310	183.66
SG-3	183.93				0.225	183.71	0.475	183.46	0.390	183.54
SG-4	184.41				0.190	184.22	0.288	184.12	0.400	184.01
SG-5	193.89				0.206	193.68	0.403	193.49	0.170	193.72
DOMTAR	185.32									
GEOCON 1B	186.60									
GEOCON 1A	186.50									
GEOCON 3	186.91									
GEOCON 4A	190.42									
GEOCON 4B	190.20									
GEOCON 5	189.33									
GEOCON 7	189.72									
GEOCON 9A	191.53									
GEOCON 9B	191.37									
GEOCON 10	193.84									
GEOCON 11	204.82									

mbtc - metres below top of casing
masl - metres above sea level

Appendix 5: Water Level Data

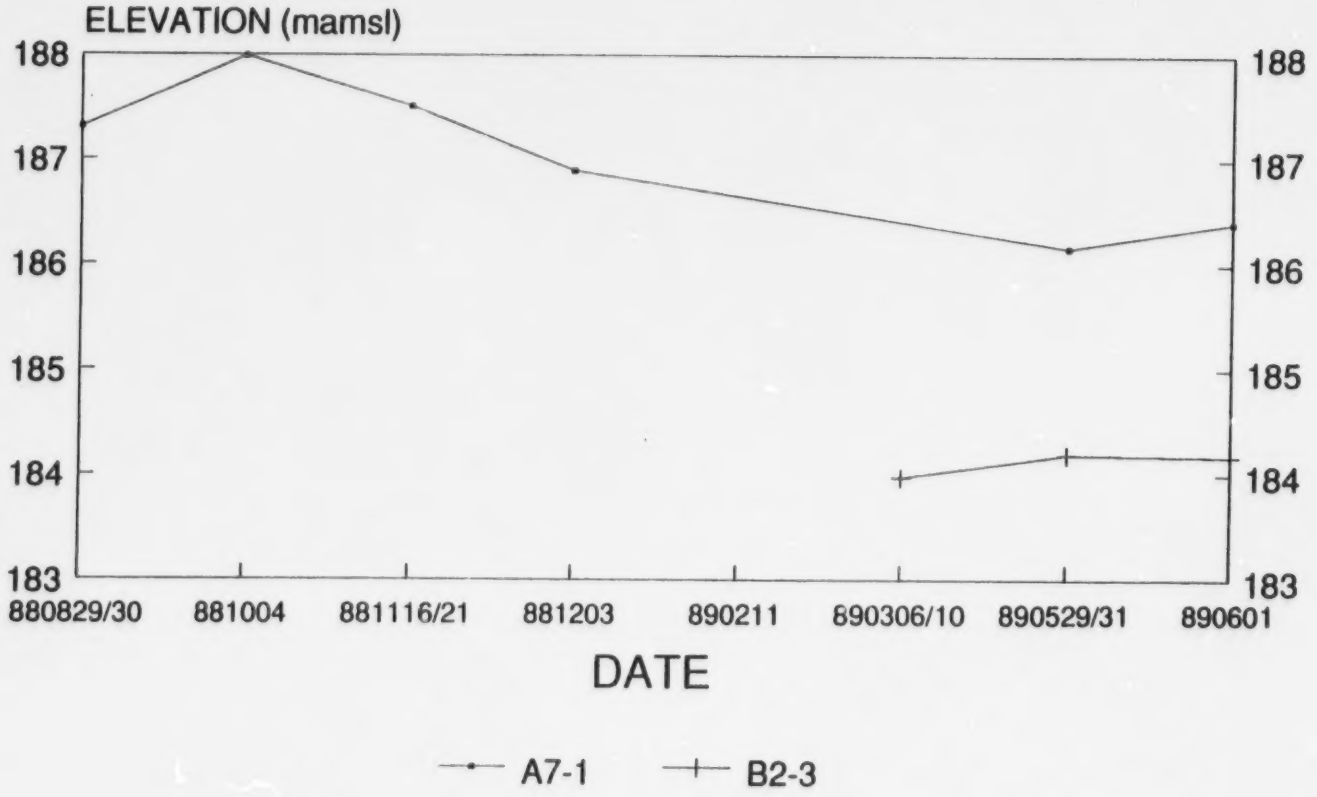
Well ID	Activity --> Top Casing Elev. (m)	Date --> Stick up (m)	+ 890211 + water levels only + Water Levels (mbtc)	(masl)	890306/10 sampling Water Levels (mbtc)	(masl)	890529/31 sampling Water Levels (mbtc)	(masl)	890601 water levels only Water Levels (mbtc)	(masl)
A1-1	193.32	0.94	+ 6.745	186.575	6.820	186.50	6.690	186.63	6.690	186.63
A1-2	193.30	0.90	+ 6.615	186.685	6.690	186.61	6.520	186.78	6.500	186.80
A2-1	193.62	0.92	+ not accessible		5.900	187.72	5.665	187.96	9.603	not static
A2-2	193.46	0.78	+ not accessible		6.430	187.03	6.385	187.08	6.310	187.15
A3	186.45	0.79	+ not accessible		Buried		Buried		not recorded	
A4-1	186.10	0.80	+ not accessible		1.410	184.69	1.150	184.95	1.190	184.91
A4-2	186.28	0.84	+ not accessible		Frozen		1.260	185.02	1.275	185.01
A5	187.84	0.86	+ not accessible		3.110	184.73	3.120	184.72	3.124	184.72
A6	187.90	0.81	+ not accessible		1.710	186.19	1.640	186.26	1.664	186.24
A7-1	188.18	0.95	+ not accessible		Frozen		2.020	186.16	1.780	186.40
A7-2	187.87	1.20	+ not accessible		1.260	186.61	1.500	186.37	1.600	186.27
B1	185.38	0.93	+ 2.180	183.200	2.310	183.07	not recorded		2.047	183.33
B2-1	186.30	0.84	+ 1.955	184.345	2.160	184.14	2.130	184.17	2.135	184.17
B2-2	186.45	0.88	+ 2.820	183.630	3.060	183.39	2.730	183.72	2.700	183.75
B2-3	186.23		+ 1.865		2.255	183.98	2.035	184.20	2.055	184.18
B3	185.83	0.97	+ 2.805	183.025	2.945	182.89	not recorded		2.695	183.14
B4-1	186.99	0.81	+ not accessible		3.420	183.57	3.280	183.71	3.505	183.49
B4-2	186.84	0.89	+ not accessible		3.930	182.91	3.690	183.15	3.743	183.10
B5	186.67	0.92	+ not accessible		3.840	182.83	3.510	183.16	3.572	183.10
C1	193.83	0.86	+ not accessible		7.775	186.06	7.770	186.06	7.775	186.06
C2-1	195.41	0.81	+ 6.795	188.615	6.760	188.65	6.740	188.67	6.795	188.62
C2-2	195.42	0.77	+ Dry		Dry		Dry		Dry	
C3	197.20	0.88	+ 7.050	190.150	7.065	190.14	7.035	190.17	7.030	190.17
C4	189.14	1.00	+ 3.900	185.240	not recorded		3.850	185.29	3.850	185.29
D1-1	186.58	0.81	+ 3.390	183.190	3.590	182.99	3.330	183.25	3.285	183.30
D1-2	186.69	0.87	+ 3.640	183.050	3.760	182.93	3.590	183.10	3.490	183.20
D2	186.61	0.80	+ 3.570	183.040	3.700	182.91	3.505	183.11	3.495	183.12
D3-1	185.82	0.82	+ not accessible		2.765	183.06	2.635	183.19	2.910	static?
D3-2	185.70	0.88	+ not accessible		2.830	182.87	2.560	183.14	2.555	183.15
D4	186.33	1.15	+ 3.295	183.035	3.455	182.88	3.250	183.08	3.225	183.11
D5-1	186.68	0.84	+ 3.095	183.585	3.195	183.49	3.030	183.65	3.115	183.57
D5-2	186.69	0.91	+ 3.205	183.485	3.230	183.46	3.150	183.54	3.179	183.51
D6	190.97	0.83	+ 5.200	185.770	5.410	185.56	5.200	185.77	5.600	185.37
SG-1	183.84		+ water frozen		water frozen		0.06	183.78	0.060	183.78
SG-2	183.97		+ water frozen		water frozen		not recorded			
SG-3	183.93		+ water frozen		water frozen		0.25	183.68	0.136	183.79
SG-4	184.41		+ water frozen		water frozen		0.210	184.20	0.210	184.20
SG-5	193.89		+ water frozen		water frozen		not recorded			
DOMTAR	185.32		+						0.600	184.72
GEOCON 1B	186.60		+						1.425	185.18
GEOCON 1A	186.50		+						1.705	184.80
GEOCON 3	186.91		+						3.050	183.86
GEOCON 4A	190.42		+						5.255	185.17
GEOCON 4B	190.20		+						5.355	184.85
GEOCON 5	189.33		+						5.415	183.92
GEOCON 7	189.72		+						4.760	184.96
GEOCON 9A	191.53		+						2.300	189.23
GEOCON 9B	191.37		+						2.065	189.31
GEOCON 10	193.84		+						6.415	187.43
GEOCON 11	204.82		+						14.865	189.96

mbtc - metres below top of casing
masl - metres above sea level

HYDROGRAPHS

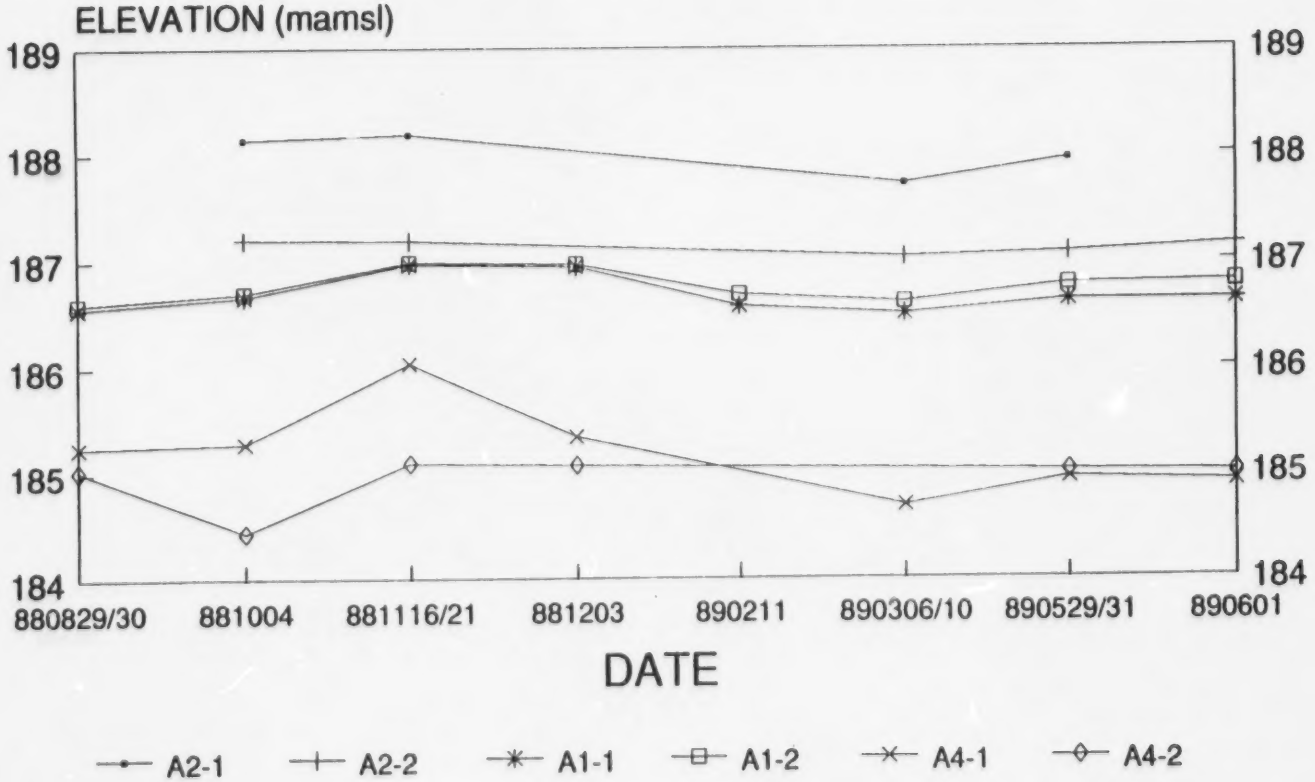
ALGOMA WATER ELEVATIONS

Bedrock Wells



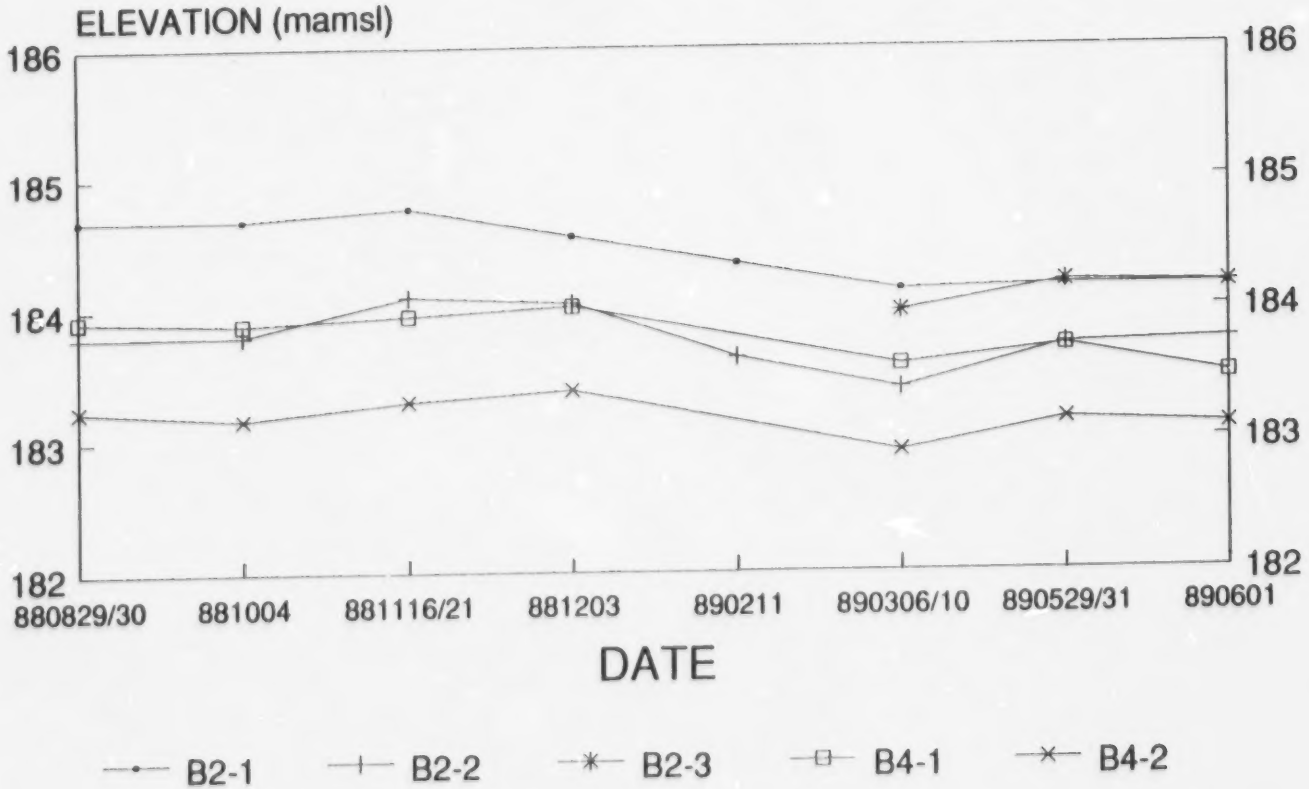
ALGOMA WATER ELEVATIONS

Site Interior Nests



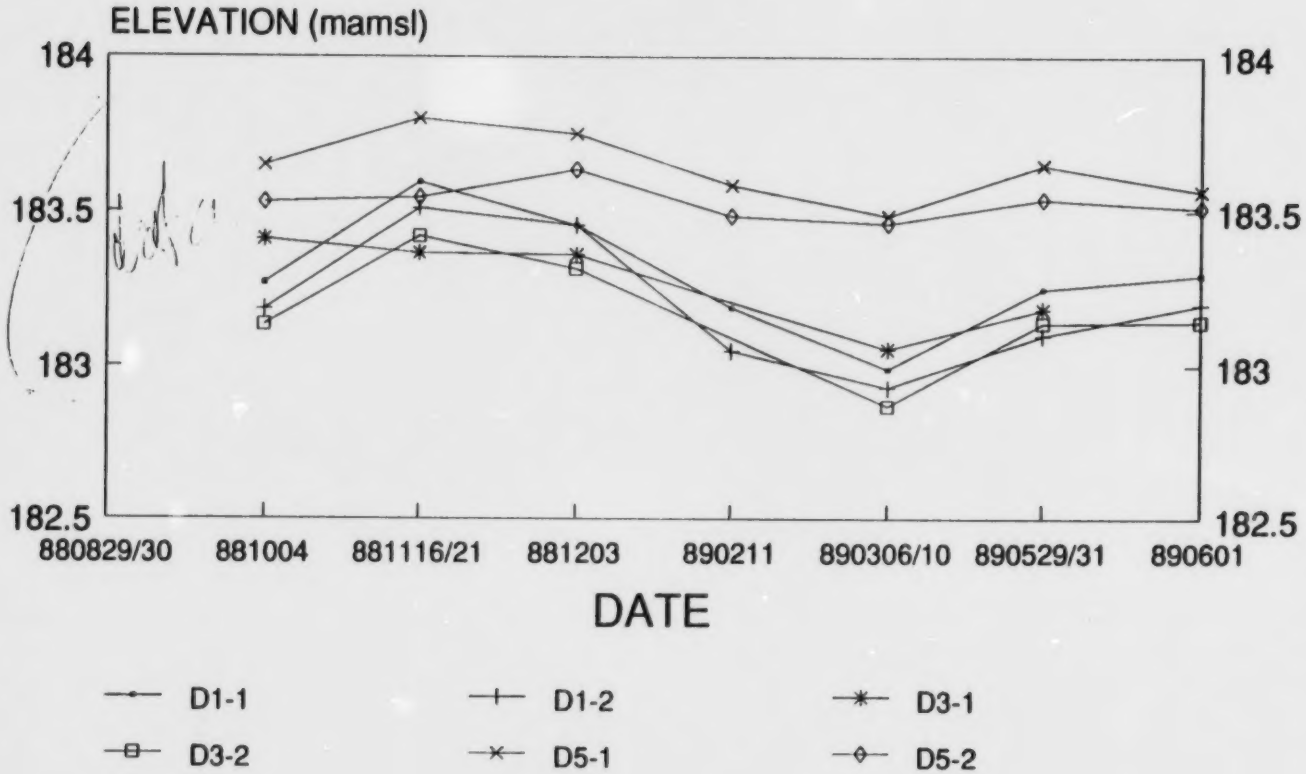
ALGOMA WATER ELEVATIONS

Shoreline Nests 1



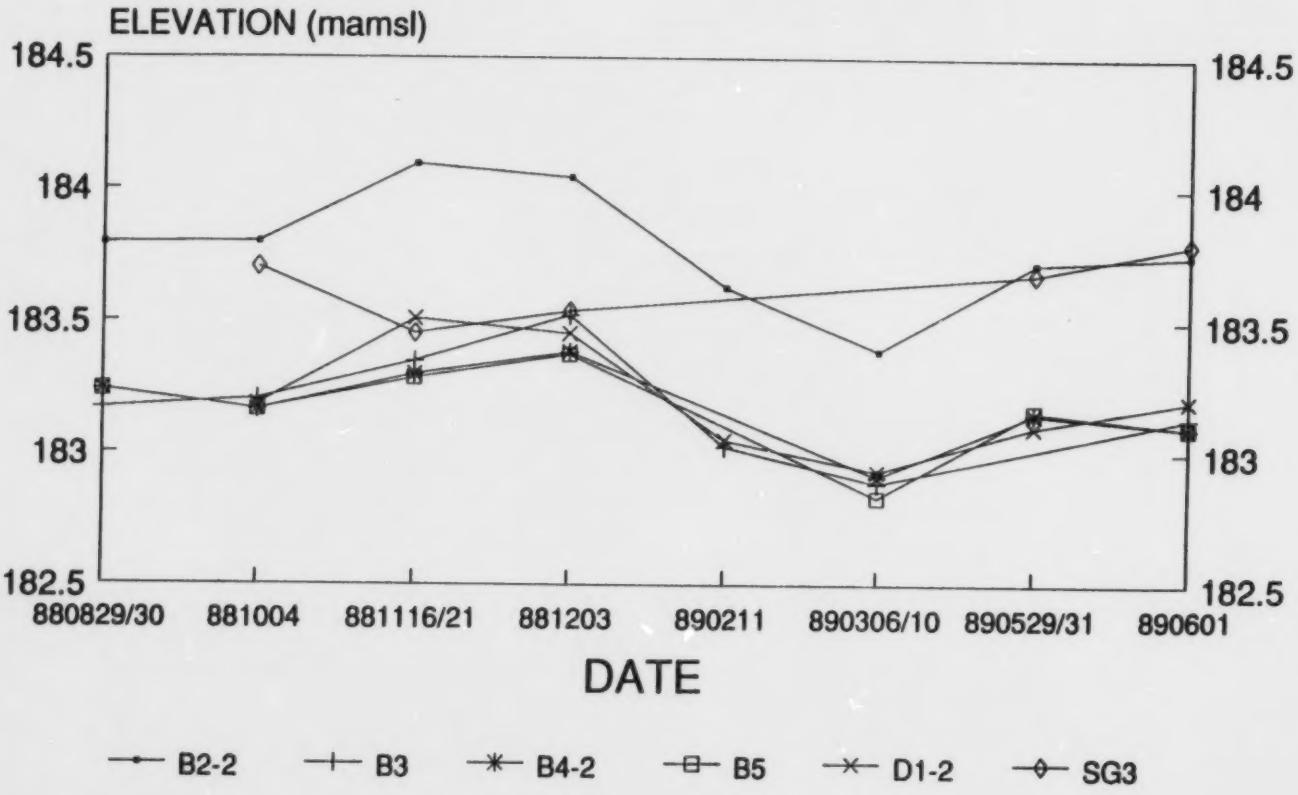
ALGOMA WATER ELEVATIONS

Shoreline Nests 2



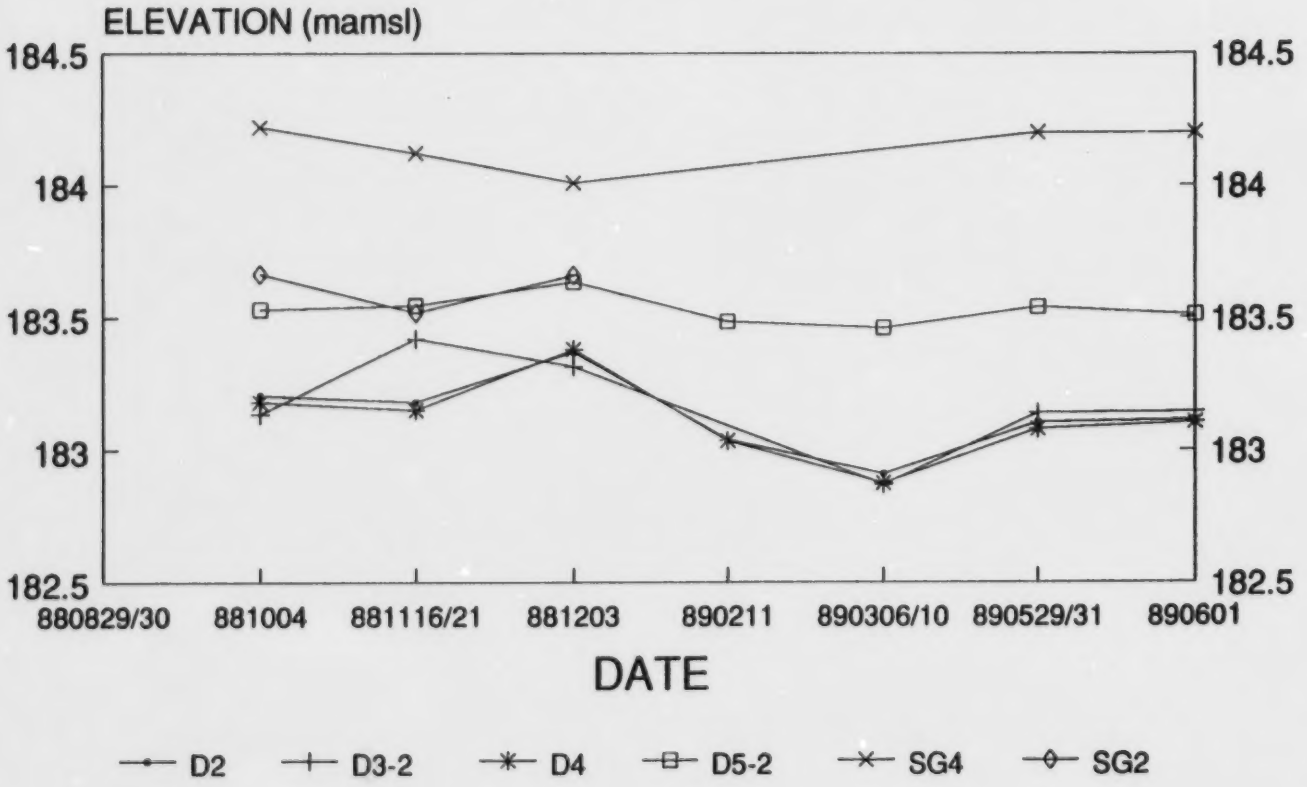
ALGOMA WATER ELEVATIONS

Shoreline Watertable Wells 1



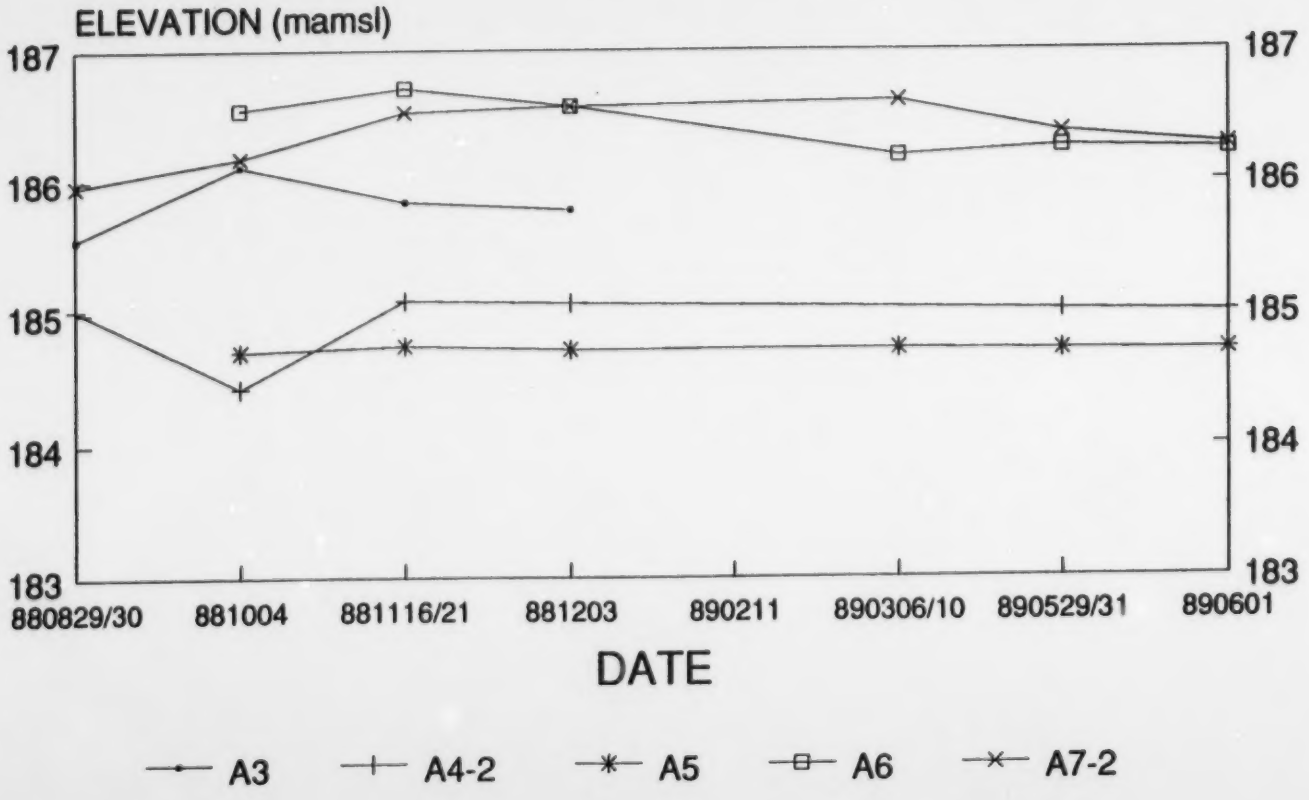
ALGOMA WATER ELEVATIONS

Shoreline Watertable Wells 2



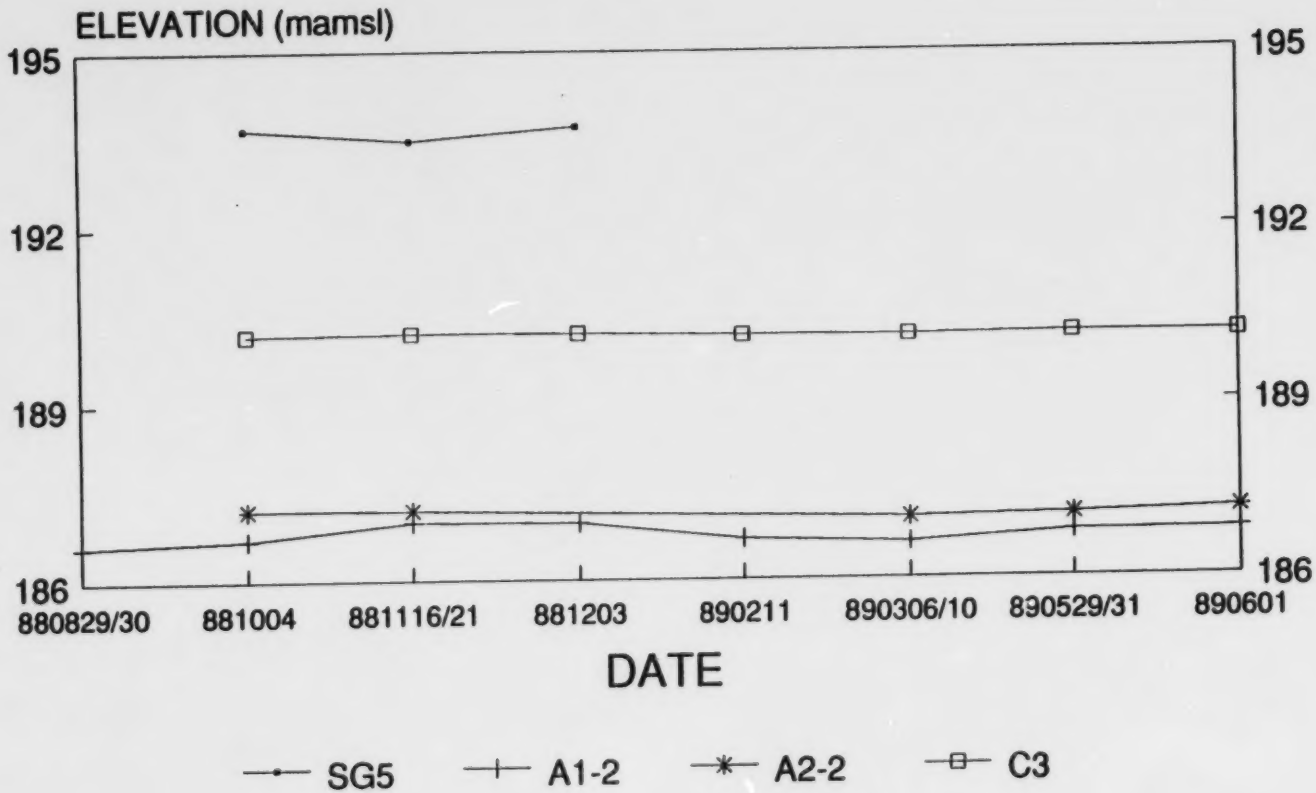
ALGOMA WATER ELEVATIONS

Interior Watertable Wells 1



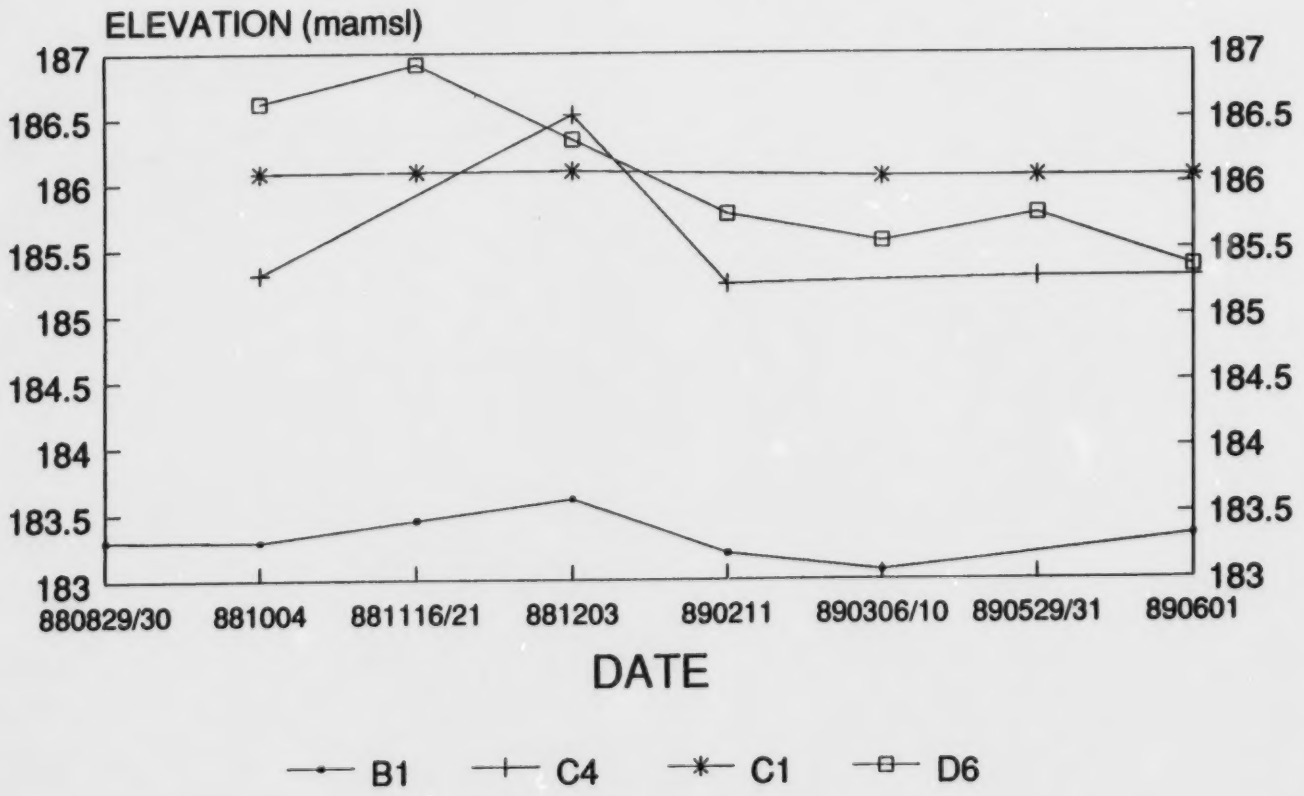
ALGOMA WATER ELEVATIONS

Interior Watertable Wells 2



ALGOMA WATER ELEVATIONS

Interior Watertable Wells 3



APPENDIX 6

Groundwater Chemical Quality Data and QA/QC Results

GROUNDWATER

Appendix 6: Groundwater

PIEZOMETER	A1-1	A1-1	A1-1	A1-1	Average	Standard Deviation
SAMPLE DATE	88/08/30	88/11/16	89/03/10	89/05/30		
BAS REF NO.	8809032-1	8811092-5	890377-1	8906008-1		
SAMPLING LEVEL	1	2	1	1		
pH	6.56	6.4	6.01	6.51	6.3700	0.2158
SPECIFIC CONDUCTANCE (µS/cm)	4440	7250	9590	5580	6715.0000	1937.5048
TEMPERATURE (C)	11.5	11	9	12	10.8750	1.1388
DISSOLVED OXYGEN	4.2	NA	0	0	1.4000	1.9799
DIC	NA	NA	NA	NA	-	-
ALKALINITY	NA	57/57	44	37	46.0000	8.2865
SULPHIDE	NA	NA	NA	NA	-	-
TOTAL CYANIDE	NA	0.012	NA	NA	0.0120	0.0000
BROMIDE	<10	<2	6	<1	1.5000	2.5981
CHLORIDE	1150	1400	1660	1870	1520.0000	270.8321
FLUORIDE	<1	3.5	<1	2.3	1.4500	1.5108
SULPHATE	1600	1580	1400	1590	1542.5000	82.5757
NITRATE-N	2	0.5	1	0.75	1.0625	0.5694
AMMONIA-N	NA	NA	NA	NA	-	-
TOTAL KJELDAHL NITROGEN	NA	NA	NA	NA	-	-
TOTAL PHOSPHOROUS	NA	NA	NA	NA	-	-
DOC	178	NA	200	165	181.0000	14.4453
PHENOLS	0.88	4.8	2.9	1.05	2.4075	1.5924
PCB (µg/L)	NA	NA	NA	NA	-	-
OIL AND GREASE	23	NA	NA	NA	23.0000	0.0000
ZINC	0.05	NA	NA	NA	0.0500	0.0000
CADMIUM	0.007	NA	NA	NA	0.0070	0.0000
MANGANESE	85/86	NA	NA	NA	85.5000	0.0000
COBALT	0.06	NA	NA	NA	0.0600	0.0000
COPPER	0.01	NA	NA	NA	0.0100	0.0000
IRON	330	NA	NA	NA	330.0000	0.0000
LEAD	0.1/0.1	NA	NA	NA	0.1000	0.0000
CHROMIUM	0.05	NA	NA	NA	0.0500	0.0000
NICKEL	0.03	NA	NA	NA	0.0300	0.0000
BERYLLIUM	NA	NA	NA	NA	-	-
MOLYBDENUM	NA	NA	NA	NA	-	-
CALCIUM	NA	670/680	730	730	711.6667	25.9272
VANADIUM	NA	NA	NA	NA	-	-
ALUMINUM	NA	NA	NA	NA	-	-
MAGNESIUM	NA	210/210	250	270	243.3333	24.9444
BARIUM	NA	NA	NA	NA	-	-
POTASSIUM	NA	131	147	147	141.6667	7.5425
STRONTIUM	NA	NA	NA	NA	-	-
SODIUM	NA	135	164	165	154.6667	13.9124
ARSENIC (µg/L)	NA	NA	NA	NA	-	-
SELENIUM (µg/L)	NA	NA	NA	NA	-	-
MERCURY (µg/L)	NA	NA	NA	NA	-	-
CATION EQUIVALENCE	11.82	60.18	67.89	69.58		
ANION EQUIVALENCE	65.78	72.97	76.43	86.24		
CHARGE BALANCE ERROR	-69.54	-9.60	-5.92	-10.69		
BTX (µg/L)						
BENZENE	NA	67000	NA	NA	67000.0000	0.0000
TOLUENE	NA	2580	NA	NA	2580.0000	0.0000
XYLENE	NA	733	NA	NA	733.0000	0.0000
TOTAL BTX	-	70313	-	-	70313.0000	0.0000

Appendix 6: Groundwater

PIEZOMETER	A1-1	A1-1	A1-1	A1-1	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE	NA	<0.1	NA	NA	0.0000	0.0000
ACENAPHTHYLENE	NA	2.3	NA	NA	2.3000	0.0000
ACENAPHTHENE	NA	1	NA	NA	1.0000	0.0000
FLUORENE	NA	0.4	NA	NA	0.4000	0.0000
PHENANTHRENE	NA	0.8	NA	NA	0.8000	0.0000
ANTHRACENE	NA	0.4	NA	NA	0.4000	0.0000
FLUORANTHENE	NA	0.1	NA	NA	0.1000	0.0000
PYRENE	NA	<0.1	NA	NA	0.0000	0.0000
BENZO(a)ANTHRACENE	NA	<0.1	NA	NA	0.0000	0.0000
CHRYSENE	NA	<0.1	NA	NA	0.0000	0.0000
BENZO(b)FLUORANTHENE	NA	<0.2	NA	NA	0.0000	0.0000
BENZO(k)FLUORANTHENE	NA	<0.1	NA	NA	0.0000	0.0000
BENZO(a)PYRENE	NA	<0.1	NA	NA	0.0000	0.0000
PERYLENE	NA	<0.1	NA	NA	0.0000	0.0000
INDENO(1.2.3-C.D)PYRENE	NA	<0.1	NA	NA	0.0000	0.0000
DIBENZO(a.h)ANTHRACENE	NA	<0.5	NA	NA	0.0000	0.0000
BENZO(g.h.i)PERYLENE	NA	<0.5	NA	NA	0.0000	0.0000
TOTAL PAHs	-	5	-	-	5.0000	0.0000

* All Units are mg/L unless otherwise specified.
NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	A1-2	A1-2	A1-2	A1-2	Average	Standard Deviation
SAMPLE DATE	88/08/30	88/11/16	89/03/10	89/05/30		
BAS REF NO.	8809032-9	8811092-6	890377-2	8906008-2		
SAMPLING LEVEL	3	2	1	1		
pH	6.88	6.87	6.66	6.95	6.8400	0.1084
SPECIFIC CONDUCTANCE (µS/cm)	7020	3450	5760	3340	4892.5000	1562.8400
TEMPERATURE (C)	11	8	9	11	9.7500	1.2990
DISSOLVED OXYGEN	2.5	NA	0	0	0.8333	1.1785
DIC	56	NA	NA	NA	56.0000	0.0000
ALKALINITY	79	161	260	310	202.5000	89.2146
SULPHIDE	<0.05	NA	NA	NA	0.0000	0.0000
TOTAL CYANIDE	0.022	0.014	NA	NA	0.0180	0.0040
BROMIDE	<10	<2	<5	<2	0.0000	0.0000
CHLORIDE	440	280	270	240	307.5000	77.9022
FLUORIDE	11	11	10	9.2	10.3000	0.7550
SULPHATE	4700	2900	2100	1900	2900.0000	1104.5361
NITRATE-N	2	0.5	0.5	1.5	1.1250	0.6495
AMMONIA-N	12.4	NA	NA	NA	12.4000	0.0000
TOTAL KJELDAHL NITROGEN	17.7	NA	NA	NA	17.7000	0.0000
TOTAL PHOSPHOROUS	0.17	NA	NA	NA	0.1700	0.0000
DOC	670	NA	400	330	466.6667	146.5909
PHENOLS	1.4	2.4	2.5/2.2	3.8	2.4875	0.8561
PCB (µg/L)	<0.1	NA	NA	NA	0.0000	0.0000
OIL AND GREASE	NA	NA	NA	NA	-	-
ZINC	0.1	NA	NA	NA	0.1000	0.0000
CADMIUM	0.0002	NA	NA	NA	0.0002	0.0000
MANGANESE	320	NA	NA	NA	320.0000	0.0000
COBALT	0.08	NA	NA	NA	0.0800	0.0000
COPPER	0.015	NA	NA	NA	0.0150	0.0000
IRON	620	NA	NA	NA	620.0000	0.0000
LEAD	0.4	NA	NA	NA	0.4000	0.0000
CHROMIUM	0.06	NA	NA	NA	0.0600	0.0000
NICKEL	0.04	NA	NA	NA	0.0400	0.0000
BERYLLIUM	<0.01	NA	NA	NA	0.0000	0.0000
MOLYBDENUM	0.06	NA	NA	NA	0.0600	0.0000
CALCIUM	410	340	330	280	340.0000	46.3681
VANADIUM	0.07	NA	NA	NA	0.0700	0.0000
ALUMINUM	1.16	NA	NA	NA	1.1600	0.0000
MAGNESIUM	620	260	300	230	352.5000	156.4249
BARIUM	0.14	NA	NA	NA	0.1400	0.0000
POTASSIUM	134	124	144	133	133.7500	7.0843
STRONTIUM	2.1	NA	NA	NA	2.1000	0.0000
SODIUM	310	230	250	220	252.5000	34.9106
ARSENIC (µg/L)	8	NA	NA	NA	8.0000	0.0000
SELENIUM (µg/L)	<1.0	NA	NA	NA	0.0000	0.0000
MERCURY (µg/L)	<0.05	NA	NA	NA	0.0000	0.0000
CATION EQUIVALENCE	110.71	51.53	55.71	45.87		
ANION EQUIVALENCE	111.09	69.89	53.94	49.45		
CHARGE BALANCE ERROR	-0.17	-15.12	1.61	-3.76		
BTX (µg/L)						
BENZENE	NA	42000	NA	NA	42000.0000	0.0000
TOLUENE	NA	870	NA	NA	870.0000	0.0000
XYLENE	NA	1500	NA	NA	1500.0000	0.0000
TOTAL BTX	-	44370	-	-	44370.0000	0.0000

Appendix 6: Groundwater

PIEZOMETER	A1-2	A1-2	A1-2	A1-2	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE	23	12.5	NA	NA	17.7500	5.2500
ACENAPHTHYLENE	7	10.4	NA	NA	8.7000	1.7000
ACENAPHTHENE	0.92	1.7	NA	NA	1.3100	0.3900
FLUORENE	10.5	3.6	NA	NA	7.0500	3.4500
PHENANTHRENE	2	1.4	NA	NA	1.7000	0.3000
ANTHRACENE	0.39	0.9	NA	NA	0.6450	0.2550
FLUORANTHENE	0.9	0.1	NA	NA	0.5000	0.4000
PYRENE	0.18	<0.1	NA	NA	0.0900	0.0900
BENZO(a)ANTHRACENE	0.02	0.1	NA	NA	0.0600	0.0400
CHRYSENE	0.03	<0.1	NA	NA	0.0150	0.0150
BENZO(b)FLUORANTHENE	<0.05	<0.2	NA	NA	0.0000	0.0000
BENZO(k)FLUORANTHENE	<0.05	<0.1	NA	NA	0.0000	0.0000
BENZO(a)PYRENE	<0.1	<0.1	NA	NA	0.0000	0.0000
PERYLENE	<0.1	<0.1	NA	NA	0.0000	0.0000
INDENO(1,2,3-C,D)PYRENE	<0.1	<0.1	NA	NA	0.0000	0.0000
DIBENZO(a,h)ANTHRACENE	<0.2	<0.5	NA	NA	0.0000	0.0000
BENZO(g,h,i)PERYLENE	<0.1	<0.5	NA	NA	0.0000	0.0000
TOTAL PAHs	44.94	30.7	-	-	37.8200	7.1200

* All Units are mg/L unless otherwise specified.
NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	A2-1	A2-1	A2-1	A2-1	Average	Standard Deviation
SAMPLE DATE	88/08/29	88/11/19	89/03/10	89/05/31		
BAS REF NO.	8809023	8811095-1	890377-3	8906045-3		
SAMPLING LEVEL	2	1	1	1		
pH	7.28	8.07	8.24	9.02	8.1525	0.6181
SPECIFIC CONDUCTANCE (µS/cm)	340	560	560	620	520.0000	106.7708
TEMPERATURE (C)	13	8	9	12	10.5000	2.0616
DISSOLVED OXYGEN	5.2	NA	5.6	6.8	5.8667	0.6799
DIC	36	NA	NA	NA	36.0000	0.0000
ALKALINITY	116	135	127	119	124.2500	7.3951
SULPHIDE	<0.05	NA	NA	NA	0.0000	0.0000
TOTAL CYANIDE	NA	NA	NA	NA	-	-
BROMIDE	<0.10	0.1	<0.1	0.05	0.0375	0.0415
CHLORIDE	5	3.9	3.8	5.5	4.5500	0.7228
FLUORIDE	0.24	0.3	0.36	0.16	0.2650	0.0740
SULPHATE	83	105	87	114	97.2500	12.7353
NITRATE-N	0.02	0.24	<0.02	0.01	0.0675	0.0998
AMMONIA-N	NA	NA	NA	NA	-	-
TOTAL KJELDAHL NITROGEN	0.43	NA	NA	NA	0.4300	0.0000
TOTAL PHOSPHOROUS	NA	NA	NA	NA	-	-
DOC	3.0	3.5/3.5	2.8/2.8	2.7/2.8	3.0125	0.2966
PHENOLS	0.003	<0.001	<0.001	0.001	0.0010	0.0012
PCB (µg/L)	NA	NA	NA	NA	-	-
OIL AND GREASE	NA	NA	NA	NA	-	-
ZINC	<0.01	NA	NA	NA	0.0000	0.0000
CADMIUM	0.0010	NA	NA	NA	0.0010	0.0000
MANGANESE	0.33	NA	NA	NA	0.3300	0.0000
COBALT	<0.01	NA	NA	NA	0.0000	0.0000
COPPER	0.010	NA	NA	NA	0.0100	0.0000
IRON	0.40	NA	NA	NA	0.4000	0.0000
LEAD	<0.05	NA	NA	NA	0.0000	0.0000
CHROMIUM	<0.01	NA	NA	NA	0.0000	0.0000
NICKEL	0.01	NA	NA	NA	0.0100	0.0000
BERYLLIUM	<0.01	NA	NA	NA	0.0000	0.0000
MOLYBDENUM	0.02	NA	NA	NA	0.0200	0.0000
CALCIUM	41	53	48	45	46.7500	4.3804
VANADIUM	0.01	NA	NA	NA	0.0100	0.0000
ALUMINUM	0.16	NA	NA	NA	0.1600	0.0000
MAGNESIUM	8.5	8.5	7.4	8.6	8.2500	0.4924
BARIUM	0.04	NA	NA	NA	0.0400	0.0000
POTASSIUM	11.3	7.8	8.6	9	9.1750	1.3007
STRONTIUM	0.56	NA	NA	NA	0.5600	0.0000
SODIUM	23	32	31	34	30.0000	4.1833
ARSENIC (µg/L)	NA	NA	NA	NA	-	-
SELENIUM (µg/L)	NA	NA	NA	NA	-	-
MERCURY (µg/L)	NA	NA	NA	NA	-	-
CATION EQUIVALENCE	4.07	4.94	4.57	4.66		
ANION EQUIVALENCE	3.03	3.65	3.19	3.72		
CHARGE BALANCE ERROR	14.63	14.99	17.85	11.27		
BTX (µg/L)						
BENZENE	NA	NA	NA	NA	-	-
TOLUENE	NA	NA	NA	NA	-	-
XYLENE	NA	NA	NA	NA	-	-
TOTAL BTX	-	-	-	-	-	-

Appendix 6: Groundwater

PIEZOMETER	A2-1	A2-1	A2-1	A2-1	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE	0.02	NA	NA	NA	0.0200	0.0000
ACENAPHTHYLENE	<0.01	NA	NA	NA	0.0000	0.0000
ACENAPHTHENE	<0.01	NA	NA	NA	0.0000	0.0000
FLUORENE	<0.01	NA	NA	NA	0.0000	0.0000
PHENANTHRENE	<0.01	NA	NA	NA	0.0000	0.0000
ANTHRACENE	<0.01	NA	NA	NA	0.0000	0.0000
FLUORANTHENE	<0.01	NA	NA	NA	0.0000	0.0000
PYRENE	<0.01	NA	NA	NA	0.0000	0.0000
BENZO(a)ANTHRACENE	<0.02	NA	NA	NA	0.0000	0.0000
CHRYSENE	<0.02	NA	NA	NA	0.0000	0.0000
BENZO(b)FLUORANTHENE	<0.05	NA	NA	NA	0.0000	0.0000
BENZO(k)FLUORANTHENE	<0.05	NA	NA	NA	0.0000	0.0000
BENZO(a)PYRENE	<0.05	NA	NA	NA	0.0000	0.0000
PERYLENE	<0.05	NA	NA	NA	0.0000	0.0000
INDENO(1,2,3-C,D)PYRENE	<0.1	NA	NA	NA	0.0000	0.0000
DIBENZO(a,h)ANTHRACENE	<0.2	NA	NA	NA	0.0000	0.0000
BENZO(g,h,i)PERYLENE	<0.1	NA	NA	NA	0.0000	0.0000
TOTAL PAHs	0.02	-	-	-	0.0200	0.0000

* All Units are mg/L unless otherwise specified.

NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	A2-2	A2-2	GWREP1 (A2-2)	A2-2	A2-2	Average	Standard Deviation
SAMPLE DATE	88/08/10	88/11/19	88/11/19	89/03/10	89/05/31		
BAS REF NO.	8808065-01	8811095-6	8811095-5	890377-4	8906045-4		
SAMPLING LEVEL	2	2	2	1	1		
pH	6.40	6.33	NA	6.47	6.72	6.4800	0.1471
SPECIFIC CONDUCTANCE (µS/cm)	860	1720	NA	2230	2220	1757.5000	557.6906
TEMPERATURE (C)	12	9	NA	10	11	10.5000	1.1180
DISSOLVED OXYGEN	3.8	NA	NA	1.4	0.3	1.3750	1.4939
DIC	40	NA	NA	NA	NA	40.0000	0.0000
ALKALINITY	108	131/131	131	118	120	121.6000	8.6856
SULPHIDE	<0.05	NA	NA	NA	NA	0.0000	0.0000
TOTAL CYANIDE	NA	0.18	0.21	NA	NA	0.1950	0.0150
BROMIDE	<0.20	<0.5/<0.5	<0.5	0.60/0.60	<0.5	0.1200	0.2400
CHLORIDE	14.0	20/21	20	23/23	28	21.1000	4.5431
FLUORIDE	0.52	1.20/0.90	1.2	0.40/0.40	0.1	0.6540	0.4109
SULPHATE	540	680/670	670	700/700	850	687.0000	98.7725
NITRATE-N	0.24	4.1/4.1	4.5	3.4/3.4	<0.1	2.4480	1.9346
AMMONIA-N	NA	NA	NA	NA	NA	-	-
TOTAL KJELDAHL NITROGEN	1.90	NA	NA	NA	NA	1.9000	0.0000
TOTAL PHOSPHOROUS	NA	NA	NA	NA	NA	-	-
DOC	15.5	NA	NA	24	27	22.1667	4.8705
PHENOLS	0.017	0.009	0.012	0.019	NA	0.0143	0.0040
PCB (µg/L)	NA	NA	NA	NA	NA	-	-
OIL AND GREASE	NA	NA	NA	NA	NA	-	-
ZINC	0.02	NA	NA	NA	NA	0.0200	0.0000
CADMIUM	0.0014	NA	NA	NA	NA	0.0014	0.0000
MANGANESE	3.3	NA	NA	NA	NA	3.3000	0.0000
COBALT	0.02	NA	NA	NA	NA	0.0200	0.0000
COPPER	<0.005	NA	NA	NA	NA	0.0000	0.0000
IRON	15.5	NA	NA	NA	NA	15.5000	0.0000
LEAD	<0.05	NA	NA	NA	NA	0.0000	0.0000
CHROMIUM	0.01	NA	NA	NA	NA	0.0100	0.0000
NICKEL	0.01	NA	NA	NA	NA	0.0100	0.0000
BERYLLIUM	<0.01	NA	NA	NA	NA	0.0000	0.0000
MOLYBDENUM	<0.02	NA	NA	NA	NA	0.0000	0.0000
CALCIUM	158	210	210	230	200	201.6000	23.8797
VANADIUM	0.02	NA	NA	NA	NA	0.0200	0.0000
ALUMINUM	0.20	NA	NA	NA	NA	0.2000	0.0000
MAGNESIUM	38	37	22	54	56	41.4000	12.4836
BARIUM	0.05	NA	NA	NA	NA	0.0500	0.0000
POTASSIUM	19.8	37/37	36	52	52	39.3600	11.9916
STRONTIUM	0.57	NA	NA	NA	NA	0.5700	0.0000
SODIUM	32	38/38	139	54	59	64.4000	38.5984
ARSENIC (µg/L)	NA	NA	NA	NA	NA	-	-
SELENIUM (µg/L)	NA	NA	NA	NA	NA	-	-
MERCURY (µg/L)	NA	NA	NA	NA	NA	-	-
CATION EQUIVALENCE	13.49	16.12	19.26	19.60	18.48		
ANION EQUIVALENCE	12.72	16.01	15.90	16.46	19.69		
CHARGE BALANCE ERROR	2.92	0.36	9.56	8.71	-3.15		
BTX (µg/L)							
BENZENE	NA	177	200	NA	NA	0.1885	0.0115
TOLUENE	NA	10	11	NA	NA	0.0105	0.0005
XYLENE	NA	33	37	NA	NA	0.0350	0.0020
TOTAL BTX	-	220	248	-	-	234.0000	14.0000

Appendix 6: Groundwater

PIEZOMETER	A2-2	A2-2	GWREP1 (A2-2)	A2-2	A2-2	Average	Standard Deviation
PAHs (µg/L)							
NAPHTHALENE	50	7.6	13.4	NA	NA	23.6667	18.7704
ACENAPHTHYLENE	0.79	1.9	1.9	NA	NA	1.5300	0.5233
ACENAPHTHENE	0.24	0.8	0.8	NA	NA	0.6133	0.2640
FLUORENE	0.15	0.4	0.4	NA	NA	0.3167	0.1179
PHENANTHRENE	0.05	0.1	0.1	NA	NA	0.0833	0.0236
ANTHRACENE	0.6	0.7	0.7	NA	NA	0.6667	0.0471
FLUORANTHENE	0.06	<0.1	<0.1	NA	NA	0.0200	0.0283
PYRENE	0.03	<0.1	<0.1	NA	NA	0.0100	0.0141
BENZO(a)ANTHRACENE	0.02	<0.1	<0.1	NA	NA	0.0067	0.0094
CHRYSENE	<0.02	<0.1	<0.1	NA	NA	0.0000	0.0000
BENZO(b)FLUORANTHENE	<0.05	<0.2	<0.2	NA	NA	0.0000	0.0000
BENZO(k)FLUORANTHENE	<0.05	<0.1	<0.1	NA	NA	0.0000	0.0000
BENZO(a)PYRENE	<0.05	<0.1	<0.1	NA	NA	0.0000	0.0000
PERYLENE	<0.05	<0.1	<0.1	NA	NA	0.0000	0.0000
INDENO(1,2,3-C,D)PYRENE	<0.05	<0.1	<0.1	NA	NA	0.0000	0.0000
DIBENZO(a,h)ANTHRACENE	<0.1	<0.5	<0.5	NA	NA	0.0000	0.0000
BENZO(g,h,i)PERYLENE	<0.05	<0.5	<0.5	NA	NA	0.0000	0.0000
TOTAL PAHs	51.94	11.5	17.3	-	-	20.1850	19.3621

* All Units are mg/L unless otherwise specified.
NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	A3	A3	A3	A3	Average	Standard Deviation
SAMPLE DATE	88/08/30	88/11/17	89/03/08	89/05/31		
BAS REF NO.	8809032-06	8811092-1	Not	Not		
SAMPLING LEVEL	1	1	Accessible	Accessible		
pH	8.61	8.79			8.7000	0.0900
SPECIFIC CONDUCTANCE (µS/cm)	180	190			185.0000	5.0000
TEMPERATURE (C)	12	8			10.0000	2.0000
DISSOLVED OXYGEN	3.6	NA			1.8000	1.8000
DIC	NA	NA			-	-
ALKALINITY	NA	87			87.0000	0.0000
SULPHIDE	NA	NA			-	-
TOTAL CYANIDE	NA	NA			-	-
BROMIDE	<0.1	<0.05			0.0000	0.0000
CHLORIDE	1.14	1.32/1.23			1.2075	0.0675
FLUORIDE	0.05	0.28/0.28			0.1650	0.1150
SULPHATE	2.3	2.3/2.3			2.3000	0.0000
NITRATE-N	<0.01	<0.01			0.0000	0.0000
AMMONIA-N	NA	NA			-	-
TOTAL KJELDAHL NITROGEN	NA	NA			-	-
TOTAL PHOSPHOROUS	NA	NA			-	-
DOC	2.5	1.0/1.0			1.7500	0.7500
PHENOLS	<0.001	<0.001			0.0000	0.0000
PCB (µg/L)	NA	NA			-	-
OIL AND GREASE	<1	NA			0.0000	0.0000
ZINC	<0.01	NA			0.0000	0.0000
CADMIUM	0.0010	NA			0.0010	0.0000
MANGANESE	0.10	NA			0.1000	0.0000
COBALT	<0.01	NA			0.0000	0.0000
COPPER	0.005	NA			0.0050	0.0000
IRON	0.20	NA			0.2000	0.0000
LEAD	<0.05	NA			0.0000	0.0000
CHROMIUM	<0.01	NA			0.0000	0.0000
NICKEL	<0.01	NA			0.0000	0.0000
BERYLLIUM	NA	NA			-	-
MOLYBDENUM	NA	NA			-	-
CALCIUM	NA	15.2			15.2000	0.0000
VANADIUM	NA	NA			-	-
ALUMINUM	NA	NA			-	-
MAGNESIUM	NA	2			2.0000	0.0000
BARIUM	NA	NA			-	-
POTASSIUM	NA	1.65			1.6500	0.0000
STRONTIUM	NA	NA			-	-
SODIUM	NA	15			15.0000	0.0000
ARSENIC (µg/L)	NA	NA			-	-
SELENIUM (µg/L)	NA	NA			-	-
MERCURY (µg/L)	NA	NA			-	-
CATION EQUIVALENCE	0.01	1.62				
ANION EQUIVALENCE	0.08	0.95				
CHARGE BALANCE ERROR	-83.57	25.85				
BTX (µg/L)						
BENZENE	NA	NA			-	-
TOLUENE	NA	NA			-	-
XYLENE	NA	NA			-	-
TOTAL BTX	-	-			-	-

Appendix 6: Groundwater

PIEZOMETER	A3	A3	A3	A3	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE	NA	NA			-	-
ACENAPHTHYLENE	NA	NA			-	-
ACENAPHTHENE	NA	NA			-	-
FLUORENE	NA	NA			-	-
PHENANTHRENE	NA	NA			-	-
ANTHRACENE	NA	NA			-	-
FLUORANTHENE	NA	NA			-	-
PYRENE	NA	NA			-	-
BENZO(a)ANTHRACENE	NA	NA			-	-
CHRYSENE	NA	NA			-	-
BENZO(b)FLUORANTHENE	NA	NA			-	-
BENZO(k)FLUORANTHENE	NA	NA			-	-
BENZO(a)PYRENE	NA	NA			-	-
PERYLENE	NA	NA			-	-
INDENO(1,2,3-C,D)PYRENE	NA	NA			-	-
DIBENZO(a,h)ANTHRACENE	NA	NA			-	-
BENZO(g,h,i)PERYLENE	NA	NA			-	-
TOTAL PAHs	-	-			-	-

* All Units are mg/L unless otherwise specified.
NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	A4-1	A4-1	A4-1	A4-1	Average	Standard Deviation
SAMPLE DATE	88/08/31	88/11/20	89/03/10	89/05/31		
BAS REF NO.	8809031-03	8811120-1	890377-8	8906045-12		
SAMPLING LEVEL	1	1	2+	2+		
pH	8.92	9.14	10.81	9.54	9.6025	0.7317
SPECIFIC CONDUCTANCE (µS/cm)	150	180	400	230	240.0000	96.6954
TEMPERATURE (C)	10.5	7	6	10	8.3750	1.9162
DISSOLVED OXYGEN	2.4	NA	4.0	3.6	2.5000	1.5588
DIC	NA	NA	NA	NA	-	-
ALKALINITY	NA	82	80	78	80.0000	1.6330
SULPHIDE	NA	NA	NA	NA	-	-
TOTAL CYANIDE	NA	NA	<0.005	<0.002	0.0000	0.0000
BROMIDE	<0.1	<0.05	<0.05	<0.05	0.0000	0.0000
CHLORIDE	3.0	2.6	4	2	2.9000	0.7280
FLUORIDE	0.38	0.43	0.34	0.31	0.3650	0.0450
SULPHATE	9.2	9	4.1	3.9	6.5500	2.5520
NITRATE-N	<0.02	<0.01	0.01	<0.1	0.0025	0.0043
AMMONIA-N	NA	NA	NA	NA	-	-
TOTAL KJELDAHL NITROGEN	NA	NA	0.14	NA	0.1400	0.0000
TOTAL PHOSPHOROUS	NA	NA	0.053	NA	0.0530	0.0000
DOC	1.5	2	NA	1	1.5000	0.4082
PHENOLS	<0.001	0.001	0.004	0.001	0.0005	0.0005
PCB (µg/L)	NA	NA	NA	NA	-	-
OIL AND GREASE	<1	NA	NA	NA	0.0000	0.0000
ZINC	<0.01	NA	<0.01	0.01	0.0033	0.0047
CADMIUM	0.0002	NA	<0.005	<0.005	0.0001	0.0001
MANGANESE	0.02	NA	0.01	0.02	0.0167	0.0047
COBALT	<0.01	NA	<0.01	<0.01	0.0000	0.0000
COPPER	0.005	NA	<0.005	0.015	0.0067	0.0062
IRON	0.28	NA	0.16	0.36	0.2667	0.0822
LEAD	<0.05	NA	<0.05	<0.05	0.0000	0.0000
CHROMIUM	<0.01	NA	<0.01	<0.01	0.0000	0.0000
NICKEL	<0.01	NA	<0.01	<0.01	0.0000	0.0000
BERYLLIUM	NA	NA	<0.01	<0.01	0.0000	0.0000
MOLYBDENUM	NA	NA	<0.02	0.01	0.0050	0.0050
CALCIUM	NA	10.8	11.2	10.5	10.8333	0.2867
VANADIUM	NA	NA	<0.01	<0.01	0.0000	0.0000
ALUMINUM	NA	NA	0.18	0.52	0.3500	0.1700
MAGNESIUM	NA	1.35	1.00	1.3	1.2167	0.1546
BARIUM	NA	NA	0.02	0.01	0.0150	0.0050
POTASSIUM	NA	2.2	2.9	2.8	2.6333	0.3091
STRONTIUM	NA	NA	0.21	0.17	0.1900	0.0200
SODIUM	NA	26	22	24	24.0000	1.6330
ARSENIC (µg/L)	NA	NA	NA	NA	-	-
SELENIUM (µg/L)	NA	NA	NA	NA	-	-
MERCURY (µg/L)	NA	NA	NA	NA	-	-
CATION EQUIVALENCE	0.01	1.84	1.70	1.82		
ANION EQUIVALENCE	0.28	1.08	1.00	0.92		
CHARGE BALANCE ERROR	-92.99	25.96	25.98	32.93		
BTX (µg/L)						
BENZENE	NA	NA	12	NA	12.0000	0.0000
TOLUENE	NA	NA	24	NA	24.0000	0.0000
XYLENE	NA	NA	<10	NA	0.0000	0.0000
TOTAL BTX	-	-	36	-	36.0000	0.0000

Appendix 6: Groundwater

PIEZOMETER	A4-1	A4-1	A4-1	A4-1	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE	NA	NA	<0.1	<0.1	0.0000	0.0000
ACENAPHTHYLENE	NA	NA	<0.1	<0.1	0.0000	0.0000
ACENAPHTHENE	NA	NA	<0.1	<0.1	0.0000	0.0000
FLUORENE	NA	NA	<0.1	<0.1	0.0000	0.0000
PHENANTHRENE	NA	NA	<0.1	<0.1	0.0000	0.0000
ANTHRACENE	NA	NA	<0.1	<0.1	0.0000	0.0000
FLUORANTHENE	NA	NA	<0.1	<0.1	0.0000	0.0000
PYRENE	NA	NA	<0.1	<0.2	0.0000	0.0000
BENZO(a)ANTHRACENE	NA	NA	<0.1	<0.2	0.0000	0.0000
CHRYSENE	NA	NA	<0.1	<0.2	0.0000	0.0000
BENZO(b)FLUORANTHENE	NA	NA	<0.2	<0.2	0.0000	0.0000
BENZO(k)FLUORANTHENE	NA	NA	<0.1	<0.2	0.0000	0.0000
BENZO(a)PYRENE	NA	NA	<0.1	<0.5	0.0000	0.0000
PERYLENE	NA	NA	<0.1	<0.5	0.0000	0.0000
INDENO(1,2,3-C,D)PYRENE	NA	NA	<0.1	<0.5	0.0000	0.0000
DIBENZO(a,h)ANTHRACENE	NA	NA	<0.5	<0.5	0.0000	0.0000
BENZO(g,h,i)PERYLENE	NA	NA	<0.5	<0.5	0.0000	0.0000
TOTAL PAHs	-	-	0	0	0.0000	0.0000

* All Units are mg/L unless otherwise specified.
NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	A4-2	A4-2	A4-2	A4-2	Average	Standard Deviation
SAMPLE DATE	88/08/30	88/11/20	89/03/10	89/05/31		
BAS REF NO.	8809032-07	8811120-2	FROZEN	8906045-13		
SAMPLING LEVEL	1	1		2+		
pH	6.93	7.16		7.57	7.2200	0.2647
SPECIFIC CONDUCTANCE (µS/cm)	610	570		540	573.3333	28.6744
TEMPERATURE (C)	12	8		10	10.0000	1.6330
DISSOLVED OXYGEN	3.6	NA		4.5	4.0500	0.4500
DIC	NA	NA		NA	-	-
ALKALINITY	NA	99		88	93.5000	5.5000
SULPHIDE	NA	NA		NA	-	-
TOTAL CYANIDE	NA	NA		<0.002	0.0000	0.0000
BROMIDE	<0.5/<0.5	<0.1		0.24	0.0800	0.1131
CHLORIDE	40/37	21		24	27.8333	7.6413
FLUORIDE	0.08/0.12	0.46		0.2	0.2533	0.1517
SULPHATE	132/126	103		81	104.3333	19.6186
NITRATE-N	0.08	0.04		<0.02	0.0400	0.0327
AMMONIA-N	NA	NA		NA	-	-
TOTAL KJELDAHL NITROGEN	NA	NA		0.39	0.3900	0.0000
TOTAL PHOSPHOROUS	NA	NA		<0.001	0.0000	0.0000
DOC	6.0	6.5		5.1	5.8667	0.5793
PHENOLS	0.002	0.001		<0.001	0.0010	0.0008
PCB (µg/L)	NA	NA		NA	-	-
OIL AND GREASE	<1	NA		NA	0.0000	0.0000
ZINC	0.01	NA		0.02	0.0150	0.0050
CADMIUM	0.0002	NA		<0.005	0.0001	0.0001
MANGANESE	0.62	NA		1	0.8100	0.1900
COBALT	<0.01	NA		0.01	0.0050	0.0050
COPPER	<0.005	NA		<0.005	0.0000	0.0000
IRON	6.0	NA		14.3	10.1500	4.1500
LEAD	<0.05	NA		<0.05	0.0000	0.0000
CHROMIUM	<0.01	NA		0.02	0.0100	0.0100
NICKEL	<0.01	NA		<0.01	0.0000	0.0000
BERYLLIUM	NA	NA		<0.01	0.0000	0.0000
MOLYBDENUM	NA	NA		0.01	0.0100	0.0000
CALCIUM	NA	52		41	46.5000	5.5000
VANADIUM	NA	NA		<0.01	0.0000	0.0000
ALUMINUM	NA	NA		0.12	0.1200	0.0000
MAGNESIUM	NA	12.2		11.5	11.8500	0.3500
BARIUM	NA	NA		0.03	0.0300	0.0000
POTASSIUM	NA	6.1		4.8	5.4500	0.6500
STRONTIUM	NA	NA		0.45	0.4500	0.0000
SODIUM	NA	21		22	21.5000	0.5000
ARSENIC (µg/L)	NA	NA		NA	-	-
SELENIUM (µg/L)	NA	NA		NA	-	-
MERCURY (µg/L)	NA	NA		NA	-	-
CATION EQUIVALENCE	0.21	4.67		4.60		
ANION EQUIVALENCE	3.77	3.73		3.24		
CHARGE BALANCE ERROR	-89.22	11.21		17.28		
BTX (µg/L)						
BENZENE	NA	NA		<2	0.0000	0.0000
TOLUENE	NA	NA		<1	0.0000	0.0000
XYLENE	NA	NA		<2	0.0000	0.0000
TOTAL BTX	-	-		0	0.0000	0.0000

Appendix 6: Groundwater

PIEZOMETER	A4-2	A4-2	A4-2	A4-2	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE	NA	NA		<0.1	0.0000	0.0000
ACENAPHTHYLENE	NA	NA		<0.1	0.0000	0.0000
ACENAPHTHENE	NA	NA		<0.1	0.0000	0.0000
FLUORENE	NA	NA		<0.1	0.0000	0.0000
PHENANTHRENE	NA	NA		<0.1	0.0000	0.0000
ANTHRACENE	NA	NA		<0.1	0.0000	0.0000
FLUORANTHENE	NA	NA		<0.1	0.0000	0.0000
PYRENE	NA	NA		<0.2	0.0000	0.0000
BENZO(a)ANTHRACENE	NA	NA		<0.2	0.0000	0.0000
CHRYSENE	NA	NA		<0.2	0.0000	0.0000
BENZO(b)FLUORANTHENE	NA	NA		<0.2	0.0000	0.0000
BENZO(k)FLUORANTHENE	NA	NA		<0.2	0.0000	0.0000
BENZO(a)PYRENE	NA	NA		<0.5	0.0000	0.0000
PERYLENE	NA	NA		<0.5	0.0000	0.0000
INDENO(1,2,3-C,D)PYRENE	NA	NA		<0.5	0.0000	0.0000
DIBENZO(a,h)ANTHRACENE	NA	NA		<0.5	0.0000	0.0000
BENZO(g,h,i)PERYLENE	NA	NA		<0.5	0.0000	0.0000
TOTAL PAHs	-	-		0	0.0000	0.0000

* All Units are mg/L unless otherwise specified.
NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	A5	A5	A5	A5	Average	Standard Deviation
SAMPLE DATE	88/08/10	88/11/18	89/03/09	89/05/30		
BAS REF NO.	8808065-02	8811095-4	8903072-2	8906008-4		
SAMPLING LEVEL	2	2	2+	2+		
pH	11.84	12.09	11.07	12.34	11.8350	0.4757
SPECIFIC CONDUCTANCE (µS/cm)	1050	1730	600	960	1085.0000	408.6869
TEMPERATURE (C)	11.5	9	7	10	9.3750	1.6346
DISSOLVED OXYGEN	5.5	NA	3.0	2.75	3.7500	1.2416
DIC	11	NA	NA	NA	11.0000	0.0000
ALKALINITY	550	240	189	230	302.2500	144.3093
SULPHIDE	<0.05	NA	NA	0.1/0.1	0.0500	0.0500
TOTAL CYANIDE	NA	0.008	0.015	<0.002	0.0077	0.0061
BROMIDE	<0.50	<0.2	0.14	0.1/0.1	0.0600	0.0616
CHLORIDE	18.3	15.6	17.0	17.4/17.8	17.1250	0.9934
FLUORIDE	0.90	0.36	0.79	0.18/0.22	0.5625	0.2907
SULPHATE	22	5.2	2.9	6.4	9.1250	7.5390
NITRATE-N	0.20	0.04	<0.1	0.04/0.04	0.0700	0.0768
AMMONIA-N	NA	NA	NA	NA	-	-
TOTAL KJELDAHL NITROGEN	18.2	NA	NA	16.1	17.1500	1.0500
TOTAL PHOSPHOROUS	NA	NA	NA	0.103	0.1030	0.0000
DOC	35/35	NA	NA	40	37.5000	2.5000
PHENOLS	0.140	0.125	0.143	0.125	0.1333	0.0083
PCB (µg/L)	NA	NA	NA	NA	-	-
OIL AND GREASE	NA	NA	NA	NA	-	-
ZINC	<0.01	NA	<0.01	<0.01	0.0000	0.0000
CADMIUM	0.0005	NA	<0.005	<0.005	0.0002	0.0002
MANGANESE	0.01	NA	0.12	0.08	0.0700	0.0455
COBALT	<0.01	NA	<0.01	<0.01	0.0000	0.0000
COPPER	0.010	NA	<0.005	0.01	0.0067	0.0047
IRON	0.04	NA	0.98	0.72	0.5800	0.3963
LEAD	<0.05	NA	<0.05	<0.05	0.0000	0.0000
CHROMIUM	0.01	NA	<0.01	<0.01	0.0033	0.0047
NICKEL	0.01	NA	<0.01	<0.01	0.0033	0.0047
BERYLLIUM	<0.01	NA	<0.01	<0.01	0.0000	0.0000
MOLYBDENUM	0.04	NA	<0.02	0.02	0.0200	0.0163
CALCIUM	136	98	82	89	101.2500	20.8492
VANADIUM	0.03	NA	0.02	0.02	0.0233	0.0047
ALUMINUM	0.54	NA	0.64	0.5	0.5600	0.0589
MAGNESIUM	0.15	2.2	4.7	1.15	2.0500	1.6930
BARIUM	0.05	NA	0.05	0.04	0.0467	0.0047
POTASSIUM	10.8	8.4	10.2	9.4	9.7000	0.9000
STRONTIUM	0.50	NA	0.26	0.2	0.3200	0.1296
SODIUM	90	50	54	51	61.2500	16.6640
ARSENIC (µg/L)	NA	NA	NA	NA	-	-
SELENIUM (µg/L)	NA	NA	NA	NA	-	-
MERCURY (µg/L)	NA	NA	NA	NA	-	-
CATION EQUIVALENCE	11.05	7.46	7.19	7.08		
ANION EQUIVALENCE	6.47	2.95	2.43	2.93		
CHARGE BALANCE ERROR	26.13	43.37	49.53	41.46		
BTX (µg/L)						
BENZENE	NA	<2	NA	NA	0.0000	0.0000
TOLUENE	NA	<17	NA	NA	0.0000	0.0000
XYLENE	NA	<2	NA	NA	0.0000	0.0000
TOTAL BTX	-	0	-	-	0.0000	0.0000

Appendix 6: Groundwater

PIEZOMETER	A5	A5	A5	A5	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE	9.1	7.3	6.0	NA	7.4667	1.2710
ACENAPHTHYLENE	0.05	<0.1	<0.1	NA	0.0167	0.0236
ACENAPHTHENE	0.15	0.2	0.2	NA	0.1833	0.0236
FLUORENE	0.1	0.1	0.1	NA	0.1000	0.0000
PHENANTHRENE	3.46	2.9	2.9	NA	3.0867	0.2640
ANTHRACENE	0.13	0.1	0.1	NA	0.1100	0.0141
FLUORANTHENE	0.81	0.6	0.9	NA	0.7700	0.1257
PYRENE	0.47	0.4	0.6	NA	0.4900	0.0829
BENZO(a)ANTHRACENE	<0.02	<0.1	<0.1	NA	0.0000	0.0000
CHRYSENE	<0.02	<0.1	0.1	NA	0.0333	0.0471
BENZO(b)FLUORANTHENE	<0.05	<0.2	<0.2	NA	0.0000	0.0000
BENZO(k)FLUORANTHENE	<0.05	<0.1	<0.1	NA	0.0000	0.0000
BENZO(a)PYRENE	<0.05	<0.1	<0.1	NA	0.0000	0.0000
PERYLENE	<0.05	<0.1	<0.1	NA	0.0000	0.0000
INDENO(1,2,3-C,D)PYRENE	<0.1	<0.1	<0.1	NA	0.0000	0.0000
DIBENZO(a,h)ANTHRACENE	<0.2	<0.5	<0.5	NA	0.0000	0.0000
BENZO(g,h,i)PERYLENE	<0.1	<0.5	<0.5	NA	0.0000	0.0000
TOTAL PAHs	14.27	11.6	10.9	-	12.2567	1.4520

* All Units are mg/L unless otherwise specified.

NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	A6	A6	A6	A6	Average	Standard Deviation
SAMPLE DATE	88/08/10	88/11/20	89/03/09	89/05/30		
BAS REF NO.	8808064-01	8811120-3	8903072-8	8906008-6		
SAMPLING LEVEL	1	1	2+	2+		
pH	9.20	8.78	8.58	9.02	8.8950	0.2351
SPECIFIC CONDUCTANCE (µS/cm)	230	360	480	260	332.5000	97.8200
TEMPERATURE (C)	12	10	7	9	9.5000	1.8028
DISSOLVED OXYGEN	3.7	NA	0.65	3.7	2.6833	1.4378
DIC	NA	NA	NA	NA	-	-
ALKALINITY	NA	143	158/157	154	151.5000	6.1779
SULPHIDE	NA	NA	NA	NA	-	-
TOTAL CYANIDE	NA	NA	<0.005	<0.002	0.0000	0.0000
BROMIDE	0.06	<0.05	0.06	0.05	0.0425	0.0249
CHLORIDE	11	10.1	12.5	10.7	11.0750	0.8842
FLUORIDE	0.25	0.05	0.16	0.26	0.1800	0.0846
SULPHATE	19	9.2	10.3	10	12.1250	3.9896
NITRATE-N	0.06	0.01	<0.01	<0.01	0.0175	0.0249
AMMONIA-N	NA	NA	NA	NA	-	-
TOTAL KJELDAHL NITROGEN	NA	NA	0.55	NA	0.5500	0.0000
TOTAL PHOSPHOROUS	NA	NA	0.044	NA	0.0440	0.0000
DOC	7.0	5.5	NA	6	6.1667	0.6236
PHENOLS	0.003	0.002	0.001	0.003	0.0018	0.0013
PCB (µg/L)	NA	NA	NA	NA	-	-
OIL AND GREASE	3	NA	NA	NA	3.0000	0.0000
ZINC	<0.01	NA	0.01	<0.01	0.0033	0.0047
CADMIUM	0.0004	NA	<0.005	<0.005	0.0001	0.0002
MANGANESE	<0.01	NA	0.17	0.17	0.1133	0.0801
COBALT	<0.01	NA	<0.01	<0.01	0.0000	0.0000
COPPER	0.005	NA	<0.005	0.01	0.0050	0.0041
IRON	0.02/0.02	NA	0.04	0.08	0.0400	0.0327
LEAD	<0.05	NA	<0.05	<0.05	0.0000	0.0000
CHROMIUM	<0.01	NA	<0.01	<0.01	0.0000	0.0000
NICKEL	<0.01	NA	<0.01	<0.01	0.0000	0.0000
BERYLLIUM	NA	NA	<0.01	<0.01	0.0000	0.0000
MOLYBDENUM	NA	NA	<0.02	<0.02	0.0000	0.0000
CALCIUM	NA	46	60	59	55.0000	6.3770
VANADIUM	NA	NA	0.01	0.01	0.0100	0.0000
ALUMINUM	NA	NA	0.08	0.14	0.1100	0.0300
MAGNESIUM	NA	8.1	9.0	9.5	8.8667	0.5793
BARIUM	NA	NA	0.04	0.04	0.0400	0.0000
POTASSIUM	NA	1.75	1.65	2.2	1.8667	0.2392
STRONTIUM	NA	NA	0.2	0.19	0.1950	0.0050
SODIUM	NA	8	7.5	9	8.1667	0.6236
ARSENIC (µg/L)	NA	NA	NA	NA	-	-
SELENIUM (µg/L)	NA	NA	NA	NA	-	-
MERCURY (µg/L)	NA	NA	NA	NA	-	-
CATION EQUIVALENCE	0.00	3.35	4.11	4.19		
ANION EQUIVALENCE	0.71	1.91	2.14	2.05		
CHARGE BALANCE ERROR	-99.80	27.55	31.54	34.34		
BTX (µg/L)						
BENZENE	NA	NA	<10	NA	0.0000	0.0000
TOLUENE	NA	NA	<10	NA	0.0000	0.0000
XYLENE	NA	NA	<10	NA	0.0000	0.0000
TOTAL BTX	-	-	0	-	0.0000	0.0000

Appendix 6: Groundwater

PIEZOMETER	A6	A6	A6	A6	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE	NA	NA	<0.1	2.3	1.1500	1.1500
ACENAPHTHYLENE	NA	NA	<0.1	<0.5	0.0000	0.0000
ACENAPHTHENE	NA	NA	<0.1	<0.5	0.0000	0.0000
FLUORENE	NA	NA	<0.1	<0.5	0.0000	0.0000
PHENANTHRENE	NA	NA	0.1	1.7	0.9000	0.8000
ANTHRACENE	NA	NA	<0.1	<0.5	0.0000	0.0000
FLUORANTHENE	NA	NA	0.1	1.9	1.0000	0.9000
PYRENE	NA	NA	<0.1	1	0.5000	0.5000
BENZO(a)ANTHRACENE	NA	NA	<0.1	<0.2	0.0000	0.0000
CHRYSENE	NA	NA	<0.1	0.6	0.3000	0.3000
BENZO(b)FLUORANTHENE	NA	NA	<0.2	0.7	0.3500	0.3500
BENZO(k)FLUORANTHENE	NA	NA	<0.1	<0.2	0.0000	0.0000
BENZO(a)PYRENE	NA	NA	<0.1	<0.5	0.0000	0.0000
PERYLENE	NA	NA	<0.1	<0.5	0.0000	0.0000
INDENO(1.2.3-C.D)PYRENE	NA	NA	<0.1	<0.5	0.0000	0.0000
DIBENZO(a.h)ANTHRACENE	NA	NA	<0.5	<0.5	0.0000	0.0000
BENZO(g.h.i)PERYLENE	NA	NA	<0.5	<0.5	0.0000	0.0000
TOTAL PAHs	-	-	0.2	8.2	2.1000	3.5228

* All Units are mg/L unless otherwise specified.
NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	A7-1	A7-1	A7-1	A7-1	Average	Standard Deviation
SAMPLE DATE	88/08/31	88/11/20	89/03/09	89/05/31		
BAS REF NO.	8809031-02	8811092-9	FROZEN	8906046-3		
SAMPLING LEVEL	1	3		3		
pH	7.85	9.39		8.63	8.6233	0.6287
SPECIFIC CONDUCTANCE (µS/cm)	180	190		210	193.3333	12.4722
TEMPERATURE (C)	NA	8		9	10.3333	2.6247
DISSOLVED OXYGEN	NA	NA		6.5	6.5000	0.0000
DIC	NA	9		13.2	11.1000	2.1000
ALKALINITY	NA	41		49/49	45.0000	4.0000
SULPHIDE	NA	NA		<0.05	0.0000	0.0000
TOTAL CYANIDE	NA	<0.002		<0.002	0.0000	0.0000
BROMIDE	<0.1/<0.1	<0.05		<0.05	0.0000	0.0000
CHLORIDE	11.6/11.0	11.5		14.1/14.1	12.3000	1.2754
FLUORIDE	0.06/0.04	0.121		0.03/0.05	0.0703	0.0361
SULPHATE	11.4/11.0	11.1		9.5/9.0	10.5167	0.8966
NITRATE-N	0.32/0.32	<0.01		0.68/0.68	0.3333	0.2778
AMMONIA-N	NA	0.55/0.56		0.037	0.2960	0.2590
TOTAL KJELDAHL NITROGEN	NA	NA		<0.02	0.0000	0.0000
TOTAL PHOSPHOROUS	NA	NA		<0.001	0.0000	0.0000
DOC	<0.05	0.5		<0.5/<0.5	0.1667	0.2357
PHENOLS	<0.001	<0.001		<0.001	0.0000	0.0000
PCB (µg/L)	NA	<0.02		<0.02	0.0000	0.0000
OIL AND GREASE	<1	NA		NA	0.0000	0.0000
ZINC	0.01/0.01	<0.01		<0.01	0.0033	0.0047
CADMIUM	0.0008	<0.005		<0.005	0.0003	0.0004
MANGANESE	0.11/0.11	0.11		0.02	0.0800	0.0424
COBALT	<0.01	<0.01		<0.01	0.0000	0.0000
COPPER	<0.005	<0.005		<0.005	0.0000	0.0000
IRON	0.14/0.14	0.04		0.34	0.1733	0.1247
LEAD	<0.05	<0.05		<0.05	0.0000	0.0000
CHROMIUM	<0.01	<0.01		<0.01	0.0000	0.0000
NICKEL	<0.01	<0.01		<0.01	0.0000	0.0000
BERYLLIUM	NA	<0.01		<0.01	0.0000	0.0000
MOLYBDENUM	NA	<0.02		<0.02	0.0000	0.0000
CALCIUM	NA	15.9		21	18.4500	2.5500
VANADIUM	NA	<0.01		<0.01	0.0000	0.0000
ALUMINUM	NA	0.02		0.04	0.0300	0.0100
MAGNESIUM	NA	4.1		4.6	4.3500	0.2500
BARIUM	NA	0.01		0.02	0.0150	0.0050
POTASSIUM	NA	1.25		1.15	1.2000	0.0500
STRONTIUM	NA	0.07		0.06	0.0650	0.0050
SODIUM	NA	4		4	4.0000	0.0000
ARSENIC (µg/L)	NA	<1		1	0.5000	0.5000
SELENIUM (µg/L)	NA	<1		<1	0.0000	0.0000
MERCURY (µg/L)	NA	0.15		<0.05	0.0500	0.0707
CATION EQUIVALENCE	0.001	1.34		1.65		
ANION EQUIVALENCE	0.56	0.97		1.09		
CHARGE BALANCE ERROR	-99.82	16.27		20.29		
BTX (µg/L)						
BENZENE	NA	<2		<2	0.0000	0.0000
TOLUENE	NA	<1		<1	0.0000	0.0000
XYLENE	NA	<2		<2	0.0000	0.0000
TOTAL BTX	-	0		0	0.0000	0.0000

Appendix 6: Groundwater

PIEZOMETER	A7-1	A7-1	A7-1	A7-1	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE	NA	<0.1		<0.1	0.0000	0.0000
ACENAPHTHYLENE	NA	<0.1		<0.1	0.0000	0.0000
ACENAPHTHENE	NA	<0.1		<0.1	0.0000	0.0000
FLUORENE	NA	<0.1		<0.1	0.0000	0.0000
PHENANTHRENE	NA	<0.1		<0.1	0.0000	0.0000
ANTHRACENE	NA	<0.1		<0.1	0.0000	0.0000
FLUORANTHENE	NA	<0.1		<0.1	0.0000	0.0000
PYRENE	NA	<0.1		<0.2	0.0000	0.0000
BENZO(a)ANTHRACENE	NA	<0.1		<0.2	0.0000	0.0000
CHRYSENE	NA	<0.1		<0.2	0.0000	0.0000
BENZO(b)FLUORANTHENE	NA	<0.2		<0.2	0.0000	0.0000
BENZO(k)FLUORANTHENE	NA	<0.1		<0.2	0.0000	0.0000
BENZO(a)PYRENE	NA	<0.1		<0.5	0.0000	0.0000
PERYLENE	NA	<0.1		<0.5	0.0000	0.0000
INDENO(1,2,3-C,D)PYRENE	NA	<0.1		<0.5	0.0000	0.0000
DIBENZO(a,h)ANTHRACENE	NA	<0.5		<0.5	0.0000	0.0000
BENZO(g,h,i)PERYLENE	NA	<0.5		<0.5	0.0000	0.0000
TOTAL PAHs	-	0		0	0.0000	0.0000

* All Units are mg/L unless otherwise specified.
NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	A7-2	A7-2	A7-2	A7-2	Average	Standard Deviation
SAMPLE DATE	88/08/30	88/11/20	89/03/08	89/05/31		
BAS REF NO.	8809032-02	8811092-4	880371-3	8906045-11		
SAMPLING LEVEL	1	1	2+	2+		
pH	8.98	8.86	8.64	8.81	8.8225	0.1221
SPECIFIC CONDUCTANCE (µS/cm)	610	200	270	250	332.5000	162.2305
TEMPERATURE (C)	10.5	8	6	11	8.8750	2.0117
DISSOLVED OXYGEN	3.8	NA	3.5	5.7	4.3333	0.9741
DIC	NA	NA	NA	NA	-	-
ALKALINITY	NA	101	98	94	97.6667	2.8674
SULPHIDE	NA	NA	NA	NA	-	-
TOTAL CYANIDE	NA	NA	<0.005	<0.002	0.0000	0.0000
BROMIDE	<0.1	<0.05	<0.05	<0.05	0.0000	0.0000
CHLORIDE	1.68	1.65/1.57	1.69	1.49	1.6175	0.0798
FLUORIDE	0.33	0.34/0.34	0.31	0.33	0.3275	0.0109
SULPHATE	10.4	10.0/9.7	6.1	6.1	8.1125	2.0219
NITRATE-N	<0.01	0.12/0.12	0.01	0.05	0.0450	0.0472
AMMONIA-N	NA	NA	NA	NA	-	-
TOTAL KJELDAHL NITROGEN	NA	NA	0.15/0.17	NA	0.1600	0.0000
TOTAL PHOSPHOROUS	NA	NA	0.048	NA	0.0000	0.0000
DOC	1.0	1	NA	1.1	1.0333	0.0471
PHENOLS	<0.001	<0.001	0.006	<0.001	0.0015	0.0026
PCB (µg/L)	NA	NA	NA	NA	-	-
OIL AND GREASE	<1	NA	NA	NA	0.0000	0.0000
ZINC	<0.01	NA	<0.01	0.01	0.0033	0.0047
CADMIUM	0.0004	NA	<0.005	<0.005	0.0001	0.0002
MANGANESE	0.01	NA	0.01	0.02	0.0133	0.0047
COBALT	<0.01	NA	<0.01	<0.01	0.0000	0.0000
COPPER	0.005	NA	<0.005	0.025	0.0100	0.0108
IRON	0.06	NA	0.06	0.52	0.2133	0.2168
LEAD	<0.05	NA	<0.05	<0.05	0.0000	0.0000
CHROMIUM	<0.01	NA	<0.01	<0.01	0.0000	0.0000
NICKEL	<0.01	NA	<0.01	<0.01	0.0000	0.0000
BERYLLIUM	NA	NA	<0.01	<0.01	0.0000	0.0000
MOLYBDENUM	NA	NA	<0.02	0.01	0.0050	0.0050
CALCIUM	NA	17.4	16.3	14.5	16.0667	1.1954
VANADIUM	NA	NA	<0.01	<0.01	0.0000	0.0000
ALUMINUM	NA	NA	0.08	0.86	0.4700	0.3900
MAGNESIUM	NA	1.9	1.70	1.85	1.8167	0.0850
BARIUM	NA	NA	0.02	0.01	0.0150	0.0050
POTASSIUM	NA	1.55	1.25	2	1.6000	0.3082
STRONTIUM	NA	NA	0.12	0.09	0.1050	0.0150
SODIUM	NA	24	23	25	24.0000	0.8165
ARSENIC (µg/L)	NA	NA	NA	NA	-	-
SELENIUM (µg/L)	NA	NA	NA	NA	-	-
MERCURY (µg/L)	NA	NA	NA	NA	-	-
CATION EQUIVALENCE	0.00	2.11	2.00	2.13		
ANION EQUIVALENCE	0.26	1.26	1.15	1.11		
CHARGE BALANCE ERROR	-98.38	25.12	26.75	31.49		
BTX (µg/L)						
BENZENE	NA	NA	<10	NA	0.0000	0.0000
TOLUENE	NA	NA	28	NA	28.0000	0.0000
XYLENE	NA	NA	98	NA	98.0000	0.0000
TOTAL BTX	-	-	126	-	126.0000	0.0000

Appendix 6: Groundwater

PIEZOMETER	A7-2	A7-2	A7-2	A7-2	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE	NA	NA	<0.1	<0.1	0.0000	0.0000
ACENAPHTHYLENE	NA	NA	<0.1	<0.1	0.0000	0.0000
ACENAPHTHENE	NA	NA	<0.1	<0.1	0.0000	0.0000
FLUORENE	NA	NA	<0.1	<0.1	0.0000	0.0000
PHENANTHRENE	NA	NA	<0.1	<0.1	0.0000	0.0000
ANTHRACENE	NA	NA	<0.1	<0.1	0.0000	0.0000
FLUORANTHENE	NA	NA	<0.1	<0.1	0.0000	0.0000
PYRENE	NA	NA	<0.1	<0.2	0.0000	0.0000
BENZO(a)ANTHRACENE	NA	NA	<0.1	<0.2	0.0000	0.0000
CHRYSENE	NA	NA	<0.1	<0.2	0.0000	0.0000
BENZO(b)FLUORANTHENE	NA	NA	<0.2	<0.2	0.0000	0.0000
BENZO(k)FLUORANTHENE	NA	NA	<0.1	<0.2	0.0000	0.0000
BENZO(a)PYRENE	NA	NA	<0.1	<0.5	0.0000	0.0000
PERYLENE	NA	NA	<0.1	<0.5	0.0000	0.0000
INDENO(1,2,3-C,D)PYRENE	NA	NA	<0.1	<0.5	0.0000	0.0000
DIBENZO(a,h)ANTHRACENE	NA	NA	<0.5	<0.5	0.0000	0.0000
BENZO(g,h,i)PERYLENE	NA	NA	<0.5	<0.5	0.0000	0.0000
TOTAL PAHs	-	-	0	0	0.0000	0.0000

* All Units are mg/L unless otherwise specified.
NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	B1	B1	B1	B1	Average	Standard Deviation
SAMPLE DATE	88/08/29	88/11/20	89/03/09	89/06/01		
BAS REF NO.	8809032-10	8811120-8	8903072-1	8906018-1		
SAMPLING LEVEL	3	2	1	1		
pH	7.86	6.86	7.87	8.13	7.6800	0.4856
SPECIFIC CONDUCTANCE (µS/cm)	380	340	410	580	427.5000	91.4809
TEMPERATURE (°C)	23	14	16	17	17.5000	3.3541
DISSOLVED OXYGEN	2.5	NA	NA	NA	2.5000	0.0000
DIC	33	NA	NA	NA	33.0000	0.0000
ALKALINITY	126	95	119	152	123.0000	20.3101
SULPHIDE	<0.05	NA	NA	NA	0.0000	0.0000
TOTAL CYANIDE	<0.002	0.002	NA	NA	0.0010	0.0010
BROMIDE	<10	NA	<1	0.05	0.0167	0.0236
CHLORIDE	11	NA	16.8	14	13.9333	2.3683
FLUORIDE	<1	NA	0.06	0.27	0.1100	0.1158
SULPHATE	80	NA	6.0	2.7/2.7	29.5667	35.6872
NITRATE-N	2.0	NA	1.7	<0.01	1.2333	0.8807
AMMONIA-N	1.32/1.37	NA	NA	NA	1.3450	0.0000
TOTAL KJELDAHL NITROGEN	1.8	NA	NA	NA	1.8000	0.0000
TOTAL PHOSPHOROUS	0.05	NA	NA	NA	0.0500	0.0000
DOC	12	NA	14	15.7	13.9000	1.5122
PHENOLS	0.10	0.05	0.067	0.05	0.0668	0.0204
PCB (µg/L)	<0.1	NA	NA	NA	0.0000	0.0000
OIL AND GREASE	NA	NA	NA	NA	-	-
ZINC	<0.01	NA	NA	NA	0.0000	0.0000
CADMIUM	0.0006	NA	NA	NA	0.0006	0.0000
MANGANESE	0.19/0.18	NA	NA	NA	0.1850	0.0000
COBALT	<0.01	NA	NA	NA	0.0000	0.0000
COPPER	<0.005	NA	NA	NA	0.0000	0.0000
IRON	0.78/0.76	NA	NA	NA	0.7700	0.0000
LEAD	<0.05	NA	NA	NA	0.0000	0.0000
CHROMIUM	<0.01	NA	NA	NA	0.0000	0.0000
NICKEL	<0.01	NA	NA	NA	0.0000	0.0000
BERYLLIUM	<0.01	NA	NA	NA	0.0000	0.0000
MOLYBDENUM	<0.02	NA	NA	NA	0.0000	0.0000
CALCIUM	33	32	39	47	37.7500	5.9739
VANADIUM	<0.01	NA	NA	NA	0.0000	0.0000
ALUMINUM	0.14	NA	NA	NA	0.1400	0.0000
MAGNESIUM	2.3	1.35	1.7	1.9	1.8125	0.3435
BARIUM	0.05	NA	NA	NA	0.0500	0.0000
POTASSIUM	4.3	4.2	4.4	8.8	5.4250	1.9498
STRONTIUM	0.08	NA	NA	NA	0.0800	0.0000
SODIUM	12.5	11.5	19.5	16	14.8750	3.1499
ARSENIC (µg/L)	7/7	NA	NA	NA	7.0000	0.0000
SELENIUM (µg/L)	<1/<2	NA	NA	NA	0.0000	0.0000
MERCURY (µg/L)	<0.05	NA	NA	NA	0.0000	0.0000
CATION EQUIVALENCE	2.53	2.32	3.05	3.42		
ANION EQUIVALENCE	3.27	0.95	1.82	1.97		
CHARGE BALANCE ERROR	-12.66	41.85	25.33	26.94		
BTX (µg/L)						
BENZENE	NA	3450	NA	NA	3450.0000	0.0000
TOLUENE	NA	519	NA	NA	519.0000	0.0000
XYLENE	NA	349	NA	NA	349.0000	0.0000
TOTAL BTX	-	4318	-	-	4318.0000	0.0000

Appendix 6: Groundwater

PIEZOMETER	B1	B1	B1	B1	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE	68	880	NA	NA	474.0000	406.0000
ACENAPHTHYLENE	170	182	NA	NA	176.0000	6.0000
ACENAPHTHENE	130	2100	NA	NA	1115.0000	985.0000
FLUORENE	130	1700	NA	NA	915.0000	785.0000
PHENANTHRENE	150	5	NA	NA	77.5000	72.5000
ANTHRACENE	99	540	NA	NA	319.5000	220.5000
FLUORANTHENE	110	2.8	NA	NA	56.4000	53.6000
PYRENE	82	1120	NA	NA	601.0000	519.0000
BENZO(a)ANTHRACENE	74	660	NA	NA	367.0000	293.0000
CHRYSENE	120	450	NA	NA	285.0000	165.0000
BENZO(b)FLUORANTHENE	83	410	NA	NA	246.5000	163.5000
BENZO(k)FLUORANTHENE	110	158	NA	NA	134.0000	24.0000
BENZO(a)PYRENE	52	400	NA	NA	226.0000	174.0000
PERYLENE	75	78	NA	NA	76.5000	1.5000
INDENO(1,2,3-C,D)PYRENE	140	106	NA	NA	123.0000	17.0000
DIBENZO(a,h)ANTHRACENE	36	26	NA	NA	31.0000	5.0000
BENZO(g,h,i)PERYLENE	75	69	NA	NA	72.0000	3.0000
TOTAL PAHs	1704	8886.8	-	-	5295.4000	3591.4000

* All Units are mg/L unless otherwise specified.

NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	B2-1	B2-1	B2-1	B2-1	GWREP2 (B2-1)	Average	Standard Deviation
SAMPLE DATE	88/08/31	88/11/19	TUBING	89/05/30	89/05/30		
BAS REF NO.	8809031-04	8811095-8	DROPPED	8906008-13	8906036-2		
SAMPLING LEVEL	2	2+		2+			
pH	11.65	9.88	10.76	9.19	NA	10.3700	0.5863
SPECIFIC CONDUCTANCE (µS/cm)	670	190	310	230	NA	350.0000	63.2456
TEMPERATURE (°C)	11	8	6	10	NA	8.7500	1.4510
DISSOLVED OXYGEN	5.5	NA	NA	5.4	NA	5.4500	0.0250
DIC	8	NA		NA	NA	8.0000	0.0000
ALKALINITY	138	50		54	NA	80.6667	40.5737
SULPHIDE	<0.05	NA		NA	NA	0.0000	0.0000
TOTAL CYANIDE	NA	<0.002		<0.002	NA	0.0000	0.0000
BROMIDE	<2	<0.05		<0.05	NA	0.0000	0.0000
CHLORIDE	16.5	14.8		11.1	NA	14.1333	2.2544
FLUORIDE	0.50	0.06		0.04	NA	0.2000	0.2123
SULPHATE	17.5	13		11.5	NA	14.0000	2.5495
NITRATE-N	0.75	0.74		0.71	NA	0.7333	0.0170
AMMONIA-N	NA	NA		NA	NA	-	-
TOTAL KJELDAHL NITROGEN	0.25	0.12/0.13		NA	NA	0.1875	0.0625
TOTAL PHOSPHOROUS	NA	1.29/1.35		NA	NA	1.3200	0.0000
DOC	0.5			<0.5	NA	0.2500	0.2500
PHENOLS	<0.001	0.002		0.002	NA	0.0013	0.0009
PCB (µg/L)	NA	NA		NA	NA	-	-
OIL AND GREASE	NA	NA		NA	NA	-	-
ZINC	<0.01	NA		<0.01	NA	0.0000	0.0000
CADMIUM	0.0010	NA		<0.005	NA	0.0003	0.0005
MANGANESE	<0.01	NA		<0.01	NA	0.0000	0.0000
COBALT	<0.01	NA		<0.01	NA	0.0000	0.0000
COPPER	<0.005	NA		0.01	NA	0.0050	0.0050
IRON	<0.02	NA		0.1	NA	0.0500	0.0500
LEAD	<0.05	NA		<0.05	NA	0.0000	0.0000
CHROMIUM	<0.01	NA		<0.01	NA	0.0000	0.0000
NICKEL	<0.01	NA		<0.01	NA	0.0000	0.0000
BERYLLIUM	<0.01	NA		<0.01	NA	0.0000	0.0000
MOLYBDENUM	<0.02	NA		<0.02	NA	0.0000	0.0000
CALCIUM	11.3	24		24	NA	19.7667	5.9868
VANADIUM	0.01	NA		<0.01	NA	0.0050	0.0050
ALUMINUM	0.06	NA		0.2	NA	0.1300	0.0070
MAGNESIUM	0.45	3.8		3.7	NA	2.6500	1.5562
BARIUM	0.04	NA		0.03	NA	0.0350	0.0050
POTASSIUM	53	4.2		4.3	NA	20.5000	22.9810
STRONTIUM	0.13	NA		0.11	NA	0.1200	0.0100
SODIUM	36	8.3		8.5	NA	17.6000	13.0110
ARSENIC (µg/L)	NA	NA		NA	NA	-	-
SELENIUM (µg/L)	NA	NA		NA	NA	-	-
MERCURY (µg/L)	NA	NA		NA	NA	-	-
CATION EQUIVALENCE	3.53	1.98		2.01	0.00		
ANION EQUIVALENCE	2.22	1.20		1.10	0.00		
CHARGE BALANCE ERROR	22.75	24.51		29.06	-		
BTX (µg/L)							
BENZENE	NA	<2		<2	<2	0.0000	0.0000
TOLUENE	NA	<1		<1	<1	0.0000	0.0000
XYLENE	NA	<2		2	<2	0.6667	0.8165
TOTAL BTX	-	0		2	0	0.6667	0.8165

Appendix 6: Groundwater

PIEZOMETER	B2-1	B2-1	B2-1	B2-1	GWREP2	Average	Standard Deviation
PAHs (µg/L)							
NAPHTHALENE	0.21	<0.1		<0.5	<0.1	0.0525	0.0227
ACENAPHTHYLENE	<0.01	<0.1		<0.5	<0.1	0.0000	0.0000
ACENAPHTHENE	0.01	<0.1		<0.5	<0.1	0.0025	0.0011
FLUORENE	0.03	<0.1		<0.5	0.1	0.0075	0.0032
PHENANTHRENE	0.04	<0.1		<0.5	<0.1	0.0100	0.0043
ANTHRACENE	<0.01	<0.1		<0.5	<0.1	0.0000	0.0000
FLUORANTHENE	3.1	<0.1		<0.5	<0.1	0.7750	0.3356
PYRENE	0.77	<0.1		<0.2	<0.2	0.1925	0.0834
BENZO(a)ANTHRACENE	1.06	<0.1		<0.2	<0.2	0.2650	0.1147
CHRYSENE	3.1	<0.1		<0.2	<0.2	0.7750	0.3356
BENZO(b)FLUORANTHENE	5.3	<0.2		<0.2	<0.2	1.3250	0.5737
BENZO(k)FLUORANTHENE	0.49	<0.1		<0.2	<0.2	0.1225	0.0530
BENZO(a)PYRENE	1.8	<0.1		<0.5	<0.5	0.4500	0.1949
PERYLENE	0.63	<0.1		<0.5	<0.5	0.1575	0.0682
INDENO(1,2,3-C,D)PYRENE	1.8	<0.1		<0.5	<0.5	0.4500	0.1949
DIBENZO(a,h)ANTHRACENE	0.97	<0.5		<0.5	<0.5	0.2425	0.1050
BENZO(g,h,i)PERYLENE	1.11	<0.5		<0.5	<0.5	0.2775	0.1202
TOTAL PAHs	20.42	0		0	0.1	5.1300	8.8278

* All Units are mg/L unless otherwise specified.
NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	B2-2	B2-2	B2-2	B2-2	Average	Standard Deviation
SAMPLE DATE	88/08/29	88/11/19	89/03/09	89/05/30		
BAS REF NO.	8809032-08	8811095-9	8903072-3	8906008-5		
SAMPLING LEVEL	2	2+	2+	2		
pH	7.42	7.53	7.69	7.57	7.5525	0.0965
SPECIFIC CONDUCTANCE (µS/cm)	1110	1070	1200	1140	1130.0000	47.4342
TEMPERATURE (°C)	11.5	8	7	15	10.3750	3.1499
DISSOLVED OXYGEN (ppm)	5.2	NA	4.5	4.8	4.8333	0.2867
DIC	41	NA	NA	NA	41.0000	0.0000
ALKALINITY	150	200	179	191	180.0000	18.8547
SULPHIDE	<0.05	NA	NA	NA	0.0000	0.0000
TOTAL CYANIDE	NA	0.005	0.022	0.006	0.0110	0.0078
BROMIDE	1.0	1.04	1.40	1.3	1.1850	0.1693
CHLORIDE	210	156	177	168	177.7500	20.0546
FLUORIDE	1.5	2	1.64	1.36	1.6250	0.2381
SULPHATE	71	24	16.6	17.2	32.2000	22.5889
NITRATE-N	<0.1	<0.05	<0.05	<0.2	0.0000	0.0000
AMMONIA-N	NA	NA	NA	NA	-	-
TOTAL KJELDAHL NITROGEN	2.6	2.4	NA	NA	2.5000	0.1000
TOTAL PHOSPHOROUS	NA	0.23	NA	NA	0.2300	0.0000
DOC	4.0	NA	NA	4	4.0000	0.0000
PHENOLS	0.001	0.001	0.016	<0.001	0.0045	0.0067
PCB (µg/L)	NA	NA	NA	NA	-	-
OIL AND GREASE	NA	NA	NA	NA	-	-
ZINC	0.02	NA	0.10	0.01	0.0433	0.0403
CADMIUM	0.0004	NA	<0.005	<0.005	0.0001	0.0002
MANGANESE	0.23	NA	0.21	0.23	0.2233	0.0094
COBALT	<0.01	NA	<0.01	<0.01	0.0000	0.0000
COPPER	<0.005	NA	<0.005	0.01	0.0033	0.0047
IRON	0.40	NA	0.56	1.52	0.8267	0.4946
LEAD	<0.05	NA	<0.05	<0.05	0.0000	0.0000
CHROMIUM	<0.01	NA	<0.01	<0.01	0.0000	0.0000
NICKEL	<0.01	NA	<0.01	<0.01	0.0000	0.0000
BERYLLIUM	<0.01	NA	<0.01	<0.01	0.0000	0.0000
MOLYBDENUM	<0.02	NA	<0.02	<0.02	0.0000	0.0000
CALCIUM	75	72	68	72	71.7500	2.4875
VANADIUM	<0.01	NA	<0.01	<0.01	0.0000	0.0000
ALUMINUM	0.46	NA	0.22	0.26	0.3133	0.1050
MAGNESIUM	21	14.7	18.5	19.6	18.4500	2.3393
BARIUM	0.25	NA	0.25	0.24	0.2467	0.0047
POTASSIUM	64	64	47	43	54.5000	9.6047
STRONTIUM	0.41	NA	0.34	0.34	0.3633	0.0330
SODIUM	77	55	59	57	62.0000	8.7750
ARSENIC (µg/L)	NA	NA	NA	NA	-	-
SELENIUM (µg/L)	NA	NA	NA	NA	-	-
MERCURY (µg/L)	NA	NA	NA	NA	-	-
CATION EQUIVALENCE	10.52	8.83	8.73	8.87		
ANION EQUIVALENCE	8.90	6.90	7.13	7.01		
CHARGE BALANCE ERROR	8.35	12.29	10.10	11.73		
BTX (µg/L)						
BENZENE	NA	<2	NA	NA	0.0000	0.0000
TOLUENE	NA	<1	NA	NA	0.0000	0.0000
XYLENE	NA	<2	NA	NA	0.0000	0.0000
TOTAL BTX	-	0	-	-	0.0000	0.0000

Appendix 6: Groundwater

PIEZOMETER	B2-2	B2-2	B2-2	B2-2	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE	0.13	<0.1	<0.1	NA	0.0433	0.0613
ACENAPHTHYLENE	0.08	0.1	<0.1	NA	0.0600	0.0432
ACENAPHTHENE	0.41	1.2	0.6	NA	0.7367	0.3367
FLUORENE	0.13	0.2	0.1	NA	0.1433	0.0419
PHENANTHRENE	0.06	<0.1	<0.1	NA	0.0200	0.0283
ANTHRACENE	<0.01	<0.1	<0.1	NA	0.0000	0.0000
FLUORANTHENE	0.04	<0.1	<0.1	NA	0.0133	0.0189
PYRENE	0.04	<0.1	<0.1	NA	0.0133	0.0189
BENZO(a)ANTHRACENE	0.02	<0.1	<0.1	NA	0.0067	0.0094
CHRYSENE	0.03	<0.1	<0.1	NA	0.0100	0.0141
BENZO(b)FLUORANTHENE	<0.05	<0.2	<0.2	NA	0.0000	0.0000
BENZO(k)FLUORANTHENE	<0.05	<0.1	<0.1	NA	0.0000	0.0000
BENZO(a)PYRENE	<0.1	<0.1	<0.1	NA	0.0000	0.0000
PERYLENE	<0.1	<0.1	<0.1	NA	0.0000	0.0000
INDENO(1,2,3-C,D)PYRENE	<0.1	<0.1	<0.1	NA	0.0000	0.0000
DIBENZO(a,h)ANTHRACENE	<0.2	<0.5	<0.5	NA	0.0000	0.0000
BENZO(g,h,i)PERYLENE	<0.1	<0.5	<0.5	NA	0.0000	0.0000
TOTAL PAHs	0.94	1.5	0.7	-	1.0467	0.3352

* All Units are mg/L unless otherwise specified.

NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	B2-3	B2-3	B2-3	B2-3	Average	Standard Deviation
SAMPLE DATE	NOT	88/11/21	89/03/09	89/05/30		
BAS REF NO.	INSTALLED	8811120-12	8903072-4	8906008-12		
SAMPLING LEVEL		2+	2+	2		
pH		8.57	8.48	7.29	8.1133	0.5833
SPECIFIC CONDUCTANCE (µS/cm)		230	300	280	270.0000	29.4392
TEMPERATURE (°C)		7	8	10	8.3333	1.2472
DISSOLVED OXYGEN (ppm)		NA	2.45	5.3	3.8750	1.4250
DIC		NA	NA	NA	-	-
ALKALINITY		62	61	60	61.0000	0.8165
SULPHIDE		NA	NA	NA	-	-
TOTAL CYANIDE		<0.002	<0.005	<0.002	0.0000	0.0000
BROMIDE		<0.05	<0.1/<0.1	<0.05	0.0000	0.0000
CHLORIDE		24	21/21	22	22.3333	1.2472
FLUORIDE		0.12/0.14	0.08/0.08	0.11	0.1067	0.0205
SULPHATE		18.5/19.4	13.2/13.4	13.5	15.2500	2.6176
NITRATE-N		0.60/0.64	0.66/0.66	0.54/0.52	0.6033	0.0544
AMMONIA-N		NA	NA	NA	-	-
TOTAL KJELDAHL NITROGEN		0.09	NA	NA	0.0900	0.0000
TOTAL PHOSPHOROUS		0.84	NA	NA	0.8400	0.0000
DOC		NA	NA	<0.5	0.0000	0.0000
PHENOLS		0.001	0.014	<0.001	0.0050	0.0064
PCB (µg/L)		NA	NA	NA	-	-
OIL AND GREASE		NA	NA	NA	-	-
ZINC		NA	<0.01	<0.01	0.0000	0.0000
CADMIUM		NA	<0.005	<0.005	0.0000	0.0000
MANGANESE		NA	<0.01	<0.01	0.0000	0.0000
COBALT		NA	<0.01	<0.01	0.0000	0.0000
COPPER		NA	<0.005	<0.005	0.0000	0.0000
IRON		NA	0.04	<0.02	0.0200	0.0200
LEAD		NA	<0.05	<0.05	0.0000	0.0000
CHROMIUM		NA	<0.01	<0.01	0.0000	0.0000
NICKEL		NA	<0.01	<0.01	0.0000	0.0000
BERYLLIUM		NA	<0.01	<0.01	0.0000	0.0000
MOLYBDENUM		NA	<0.02	<0.02	0.0000	0.0000
CALCIUM		23	25	26	24.6667	1.2472
VANADIUM		NA	<0.01	<0.01	0.0000	0.0000
ALUMINUM		NA	0.08	0.04	0.0600	0.0200
MAGNESIUM		3.9	4.1	4.4	4.1333	0.2055
BARIUM		NA	0.04	0.04	0.0400	0.0000
POTASSIUM		4.9	4.3	4.2	4.4667	0.3091
STRONTIUM		NA	0.48	0.47	0.4750	0.0050
SODIUM		16.5	8.5	8.5	11.1667	3.7712
ARSENIC (µg/L)		NA	NA	NA	-	-
SELENIUM (µg/L)		NA	NA	NA	-	-
MERCURY (µg/L)		NA	NA	NA	-	-
CATION EQUIVALENCE		2.31	2.07	2.14		
ANION EQUIVALENCE		1.70	1.49	1.51		
CHARGE BALANCE ERROR		15.22	16.43	17.29		
BTX (µg/L)						
BENZENE		<2	NA	NA	0.0000	0.0000
TOLUENE		<1	NA	NA	0.0000	0.0000
XYLENE		<2	NA	NA	0.0000	0.0000
TOTAL BTX		0	-	-	0.0000	0.0000

Appendix 6: Groundwater

PIEZOMETER	B2-3	B2-3	B2-3	B2-3	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE		<0.1	<0.1	NA	0.0000	0.0000
ACENAPHTHYLENE		<0.1	<0.1	NA	0.0000	0.0000
ACENAPHTHENE		<0.1	<0.1	NA	0.0000	0.0000
FLUORENE		<0.1	<0.1	NA	0.0000	0.0000
PHENANTHRENE		<0.1	<0.1	NA	0.0000	0.0000
ANTHRACENE		<0.1	<0.1	NA	0.0000	0.0000
FLUORANTHENE		<0.1	<0.1	NA	0.0000	0.0000
PYRENE		<0.1	<0.1	NA	0.0000	0.0000
BENZO(a)ANTHRACENE		<0.1	<0.1	NA	0.0000	0.0000
CHRYSENE		<0.1	<0.1	NA	0.0000	0.0000
BENZO(b)FLUORANTHENE		<0.2	<0.2	NA	0.0000	0.0000
BENZO(k)FLUORANTHENE		<0.1	<0.1	NA	0.0000	0.0000
BENZO(a)PYRENE		<0.1	<0.1	NA	0.0000	0.0000
PERYLENE		<0.1	<0.1	NA	0.0000	0.0000
INDENO(1,2,3-C,D)PYRENE		<0.1	<0.1	NA	0.0000	0.0000
DIBENZO(a,h)ANTHRACENE		<0.5	<0.5	NA	0.0000	0.0000
BENZO(g,h,i)PERYLENE		<0.5	<0.5	NA	0.0000	0.0000
TOTAL PAHs		0	0	-	0.0000	0.0000

* All Units are mg/L unless otherwise specified.
NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	B3	B3	B3	B3	GWREP3 (B3)	Average	Standard Deviation
SAMPLE DATE	88/08/30	88/11/20	89/03/08	89/06/01	89/06/01		
BAS REF NO.	8809032-03	8811120-4	880371-4	8906018-2	8906018-7		
SAMPLING LEVEL	1	2+	2+	2+			
pH	12.10	12.20	12.44	12.1	NA	12.2100	0.1389
SPECIFIC CONDUCTANCE (µS/cm)	1610	1880	2470	2000	NA	1990.0000	311.0466
TEMPERATURE (°C)	13.5	10	6	9	NA	9.6250	2.6780
DISSOLVED OXYGEN (ppm)	1.8	NA	NA	NA	NA	1.8000	0.0000
DIC	NA	NA	NA	NA	NA	-	-
ALKALINITY	NA	220	260	250	NA	243.3333	16.9967
SULPHIDE	NA	NA	NA	NA	NA	-	-
TOTAL CYANIDE	NA		0.082	0.004	NA	0.0430	0.0390
BROMIDE	<1	<0.5	0.24/0.24	0.2	NA	0.1100	0.1109
CHLORIDE	37	48	64/62	130	NA	69.5000	36.1282
FLUORIDE	0.30	0.5	0.40/0.40	0.44	NA	0.4100	0.0728
SULPHATE	104	110	130/132	103	NA	112.0000	11.2916
NITRATE-N	<0.1	<0.1	<0.05	<0.05	NA	0.0000	0.0000
AMMONIA-N	NA	NA	NA	NA	NA	-	-
TOTAL KJELDAHL NITROGEN	NA	NA	3.1	NA	NA	3.1000	0.0000
TOTAL PHOSPHOROUS	NA	NA	0.005	NA	NA	0.0050	0.0000
DOC	4.0	4	NA	3.2	NA	3.7333	0.3771
PHENOLS	0.015	0.006	0.009	0.006	NA	0.0090	0.0037
PCB (µg/L)	NA	NA	NA	NA	NA	-	-
OIL AND GREASE	2	NA	NA	NA	NA	2.0000	0.0000
ZINC	0.01	NA	<0.01	<0.01	NA	0.0033	0.0047
CADMIUM	0.0008	NA	<0.005	<0.005	NA	0.0003	0.0004
MANGANESE	<0.01	NA	<0.01	<0.01	NA	0.0000	0.0000
COBALT	0.02	NA	<0.01	<0.01	NA	0.0067	0.0094
COPPER	<0.005	NA	<0.005	<0.005	NA	0.0000	0.0000
IRON	0.02	NA	0.04	<0.02	NA	0.0200	0.0163
LEAD	<0.05	NA	<0.05	<0.05	NA	0.0000	0.0000
CHROMIUM	0.02	NA	<0.01	0.01	NA	0.0100	0.0082
NICKEL	<0.01	NA	<0.01	<0.01	NA	0.0000	0.0000
BERYLLIUM	NA	NA	<0.01	<0.01	NA	0.0000	0.0000
MOLYBDENUM	NA	NA	0.02	<0.02	NA	0.0100	0.0100
CALCIUM	NA	119/119	128	129	NA	128.6667	7.7603
VANADIUM	NA	NA	0.03	0.04	NA	0.0350	0.0050
ALUMINUM	NA	NA	0.36	0.2	NA	0.2800	0.0800
MAGNESIUM	NA	0.15	0.10	0.25	NA	0.1667	0.0624
BARIUM	NA	NA	0.08	0.6	NA	0.3400	0.2600
POTASSIUM	NA	39	54	43	NA	45.3333	6.3421
STRONTIUM	NA	NA	0.76	0.68	NA	0.7200	0.0400
SODIUM	NA	27	34	69	NA	43.3333	18.3727
ARSENIC (µg/L)	NA	NA	NA	NA	NA	-	-
SELENIUM (µg/L)	NA	NA	NA	NA	NA	-	-
MERCURY (µg/L)	NA	NA	NA	NA	NA	-	-
CATION EQUIVALENCE	0.00	8.12	9.80	10.58	0.00		
ANION EQUIVALENCE	3.21	5.84	7.10	8.31	0.00		
CHARGE BALANCE ERROR	-99.96	16.33	15.94	12.03	-		
BTX (µg/L)							
BENZENE	NA	NA	19	NA	NA	19.0000	0.0000
TOLUENE	NA	NA	17	NA	NA	17.0000	0.0000
XYLENE	NA	NA	<10	NA	NA	0.0000	0.0000
TOTAL BTX	-	-	36	-	-	36.0000	0.0000

Appendix 6: Groundwater

PIEZOMETER	B3	B3	B3	B3	GWREP3	Average	Standard Deviation
PAHs (µg/L)							
NAPHTHALENE	NA	NA	0.1	<0.1	0.2	0.1000	0.0816
ACENAPHTHYLENE	NA	NA	0.3	0.4	0.3	0.3333	0.0471
ACENAPHTHENE	NA	NA	2.3	2.3	2.2	2.2667	0.0471
FLUORENE	NA	NA	1.9	2.4	2.1	2.1333	0.2055
PHENANTHRENE	NA	NA	3.5	4.5	4.7	4.2333	0.5249
ANTHRACENE	NA	NA	0.8	0.7	0.9	0.8000	0.0816
FLUORANTHENE	NA	NA	2.6	3.2	3.4	3.0667	0.3399
PYRENE	NA	NA	1.9	2.3	2.5	2.2333	0.2494
BENZO(a)ANTHRACENE	NA	NA	0.1	0.2	0.5	0.2667	0.1700
CHRYSENE	NA	NA	0.1	0.2	0.5	0.2667	0.1700
BENZO(b)FLUORANTHENE	NA	NA	<0.2	<0.2	0.7	0.2333	0.3300
BENZO(k)FLUORANTHENE	NA	NA	<0.1	<0.2	<0.2	0.0000	0.0000
BENZO(a)PYRENE	NA	NA	<0.1	<0.5	<0.5	0.0000	0.0000
PERYLENE	NA	NA	<0.1	<0.5	<0.5	0.0000	0.0000
INDENO(1.2.3-C,D)PYRENE	NA	NA	<0.1	<0.5	<0.5	0.0000	0.0000
DIBENZO(a,h)ANTHRACENE	NA	NA	<0.5	<0.5	<0.5	0.0000	0.0000
BENZO(g,h,i)PERYLENE	NA	NA	<0.5	<0.5	<0.5	0.0000	0.0000
TOTAL PAHs	-	-	13.6	16.2	18	15.9333	1.8062

* All Units are mg/L unless otherwise specified.

NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	B4-1	B4-1	B4-1	B4-1	Average	Standard Deviation
SAMPLE DATE	88/08/31	88/11/20	89/03/09	89/05/31		
BAS REF NO.	8809031-01	8811120-9	8903072-5	8906045-5		
SAMPLING LEVEL	1	2+	2+	2		
pH	9.61	10.18	9.62	9.82	9.8075	0.2308
SPECIFIC CONDUCTANCE (µS/cm)	220	260	290	250	255.0000	25.0000
TEMPERATURE (°C)	12	8	7	10	9.2500	1.9203
DISSOLVED OXYGEN (ppm)	3.5	NA	4.0	8	5.1667	2.0138
DIC	NA	NA	NA	NA	-	-
ALKALINITY	NA	34	51	43	42.6667	6.9442
SULPHIDE	NA	NA	NA	NA	-	-
TOTAL CYANIDE	NA	<0.002	<0.005	<0.002	0.0000	0.0000
BROMIDE	<0.1	<0.05	<0.05	<0.05	0.0000	0.0000
CHLORIDE	31	27	29	26	28.2500	1.9203
FLUORIDE	0.19	0.28/0.30	0.20	0.25	0.2325	0.0402
SULPHATE	20/20	16.5/16.8	15.0	21	18.1625	2.4350
NITRATE-N	0.06	0.04	0.02	0.05	0.0425	0.0148
AMMONIA-N	NA	NA	NA	NA	-	-
TOTAL KJELDAHL NITROGEN	NA	0.17/0.16	NA	NA	0.1650	0.0000
TOTAL PHOSPHOROUS	NA	6.0/6.2	NA	NA	6.1000	0.0000
DOC	0.5	NA	NA	0.8	0.6500	0.1500
PHENOLS	<0.001	0.001	0.015	<0.001	0.0040	0.0064
PCB (µg/L)	NA	NA	NA	NA	-	-
OIL AND GREASE	<1	NA	NA	NA	0.0000	0.0000
ZINC	<0.01	NA	0.03	<0.01	0.0100	0.0141
CADMIUM	0.0008	NA	<0.005	<0.005	0.0003	0.0004
MANGANESE	<0.01	NA	<0.01	0.11	0.0367	0.0519
COBALT	<0.01	NA	<0.01	<0.01	0.0000	0.0000
COPPER	0.005	NA	<0.005	0.03	0.0117	0.0131
IRON	0.06	NA	0.04	2.3	0.8000	1.0607
LEAD	<0.05	NA	<0.05	<0.05	0.0000	0.0000
CHROMIUM	<0.01	NA	<0.01	<0.01	0.0000	0.0000
NICKEL	<0.01	NA	<0.01	<0.01	0.0000	0.0000
BERYLLIUM	NA	NA	<0.01	<0.01	0.0000	0.0000
MOLYBDENUM	NA	NA	<0.02	<0.01	0.0000	0.0000
CALCIUM	NA	32/32	34/35	26	30.8333	3.5668
VANADIUM	NA	NA	<0.01	<0.01	0.0000	0.0000
ALUMINUM	NA	NA	0.08/0.04	2.9	1.4800	1.4200
MAGNESIUM	NA	1.50/1.50	2.7/2.7	3.8	2.6667	0.9393
BARIUM	NA	NA	0.04/0.04	0.06	0.0500	0.0100
POTASSIUM	NA	3.3/3.3	2.6/2.5	3.9	3.2500	0.5523
STRONTIUM	NA	NA	0.16/0.17	0.15	0.1575	0.0075
SODIUM	NA	9.0/9.0	6.0/6.0	9.5	8.1667	1.5456
ARSENIC (µg/L)	NA	NA	NA	NA	-	-
SELENIUM (µg/L)	NA	NA	NA	NA	-	-
MERCURY (µg/L)	NA	NA	NA	NA	-	-
CATION EQUIVALENCE	0.00	2.20	2.28	2.53		
ANION EQUIVALENCE	1.29	1.45	1.64	1.60		
CHARGE BALANCE ERROR	-99.67	20.61	16.28	22.45		
BTX (µg/L)						
BENZENE	NA	<2	NA	NA	0.0000	0.0000
TOLUENE	NA	<1	NA	NA	0.0000	0.0000
XYLENE	NA	<2	NA	NA	0.0000	0.0000
TOTAL BTX	-	0	-	-	0.0000	0.0000

Appendix 6: Groundwater

PIEZOMETER	B4-1	B4-1	B4-1	B4-1	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE	NA	<0.1	<0.1	NA	0.0000	0.0000
ACENAPHTHYLENE	NA	<0.1	<0.1	NA	0.0000	0.0000
ACENAPHTHENE	NA	<0.1	<0.1	NA	0.0000	0.0000
FLUORENE	NA	<0.1	<0.1	NA	0.0000	0.0000
PHENANTHRENE	NA	0.1	<0.1	NA	0.0500	0.0500
ANTHRACENE	NA	<0.1	<0.1	NA	0.0000	0.0000
FLUORANTHENE	NA	0.2	0.2	NA	0.2000	0.0000
PYRENE	NA	0.2	0.2	NA	0.2000	0.0000
BENZO(a)ANTHRACENE	NA	<0.1	<0.1	NA	0.0000	0.0000
CHRYSENE	NA	<0.1	<0.1	NA	0.0000	0.0000
BENZO(b)FLUORANTHENE	NA	<0.2	<0.1	NA	0.0000	0.0000
BENZO(k)FLUORANTHENE	NA	<0.1	<0.1	NA	0.0000	0.0000
BENZO(a)PYRENE	NA	<0.1	<0.1	NA	0.0000	0.0000
PERYLENE	NA	<0.1	<0.1	NA	0.0000	0.0000
INDENO(1,2,3-C,D)PYRENE	NA	<0.1	<0.1	NA	0.0000	0.0000
DIBENZO(a,h)ANTHRACENE	NA	<0.5	<0.5	NA	0.0000	0.0000
BENZO(g,h,i)PERYLENE	NA	<0.5	<0.5	NA	0.0000	0.0000
TOTAL PAHs	-	0.5	0.4	-	0.4500	0.0500

* All Units are mg/L unless otherwise specified.
NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	B4-2	B4-2	B4-2	GWREP2 (B4-2)	B4-2	Average	Standard Deviation
SAMPLE DATE	88/08/29	88/11/20	89/03/09	89/03/09	89/05/31		
BAS REF NO.	8809032-05	8811120-10	8903072-6	8903072-7	8906045-6		
SAMPLING LEVEL	1	2+	2+		2		
pH	12.37	12.5	12.64	NA	12.32	12.4575	0.1242
SPECIFIC CONDUCTANCE (µS/cm)	4180	3130	3650	NA	3400	3590.0000	387.1046
TEMPERATURE (°C)	13	9	6	NA	9	9.2500	2.4875
DISSOLVED OXYGEN (ppm)	5.9	NA	0	0.9	0	1.7000	2.4525
DIC	NA	NA	NA	NA	NA	-	-
ALKALINITY	NA	510	450	470	430	465.0000	29.5804
SULPHIDE	NA	NA	NA	NA	NA	-	-
TOTAL CYANIDE	NA	<0.002	0.045	0.046	<0.002	0.0228	0.0228
BROMIDE	<5	<1	<1	<1	<1	0.0000	0.0000
CHLORIDE	290	118	104	100	150	152.4000	71.0087
FLUORIDE	<0.5	1	0.80	0.80	<0.2	0.5200	0.4308
SULPHATE	20	42	33	36	44	35.0000	8.4853
NITRATE-N	0.50	<0.2	<0.2	<0.2	<0.2	0.1000	0.2000
AMMONIA-N	NA	NA	NA	NA	NA	-	-
TOTAL KJELDAHL NITROGEN	NA	2.4	NA	NA	NA	2.4000	0.0000
TOTAL PHOSPHOROUS	NA	0.47	NA	NA	NA	0.4700	0.0000
DOC	4.5/4.5	NA	NA	NA	3.6	4.0500	0.4500
PHENOLS	0.007	0.002	0.002	0.002	0.003	0.0028	0.0023
PCB (µg/L)	NA	NA	NA	NA	NA	-	-
OIL AND GREASE	<1	NA	NA	NA	NA	0.0000	0.0000
ZINC	0.01	NA	<0.01	<0.01	<0.01	0.0025	0.0043
CADMIUM	0.0002	NA	<0.005	<0.005	<0.005	0.0001	0.0001
MANGANESE	0.01	NA	<0.01	0.02	<0.01	0.0075	0.0083
COBALT	0.03/0.03	NA	<0.01	<0.01	<0.01	0.0075	0.0130
COPPER	<0.005	NA	<0.005	<0.005	<0.005	0.0000	0.0000
IRON	0.02	NA	0.08	0.04	<0.02	0.0350	0.0296
LEAD	<0.05	NA	<0.05	<0.05	<0.05	0.0000	0.0000
CHROMIUM	0.03/0.02	NA	<0.01	<0.01	0.01	0.0088	0.0102
NICKEL	0.01/0.02	NA	<0.01	<0.01	<0.01	0.0038	0.0065
BERYLLIUM	NA	NA	<0.01	<0.01	<0.01	0.0000	0.0000
MOLYBDENUM	NA	NA	<0.02	<0.02	0.02	0.0067	0.0094
CALCIUM	NA	250	240	230	200	230.0000	18.7083
VANADIUM	NA	NA	0.04	0.04	<0.01	0.0267	0.0189
ALUMINUM	NA	NA	0.46	0.46	0.5	0.4733	0.0189
MAGNESIUM	NA	0.25/0.30	0.1	0.1	0.15	0.1563	0.0715
BARIUM	NA	NA	0.19	0.19	0.23	0.2033	0.0189
POTASSIUM	NA	56	42	40	46	46.0000	6.1644
STRONTIUM	NA	NA	0.85	0.82	0.77	0.8133	0.0330
SODIUM	NA	38/37	32	32	36	34.3750	2.4335
ARSENIC (µg/L)	NA	NA	NA	NA	NA	-	-
SELENIUM (µg/L)	NA	NA	NA	NA	NA	-	-
MERCURY (µg/L)	NA	NA	NA	NA	NA	-	-
CATION EQUIVALENCE	0.00	15.56	14.50	13.95	12.79		
ANION EQUIVALENCE	8.61	9.30	8.12	8.27	9.44		
CHARGE BALANCE ERROR	-99.98	25.19	28.24	25.59	15.05		
BTX (µg/L)							
BENZENE	NA	<2	NA	NA	NA	0.0000	0.0000
TOLUENE	NA	2	NA	NA	NA	0.0000	0.0000
XYLENE	NA	<2	NA	NA	NA	0.0000	0.0000
TOTAL BTX	-	2	-	-	-	2.0000	0.0000

Appendix 6: Groundwater

PIEZOMETER	B4-2	B4-2	B4-2	GWREP2	B4-2	Average	Standard Deviation
PAHs (µg/L)							
NAPHTHALENE	NA	1.5	1.3	1.3	NA	1.3667	0.0943
ACENAPHTHYLENE	NA	<0.1	<0.1	0	NA	0.0000	0.0000
ACENAPHTHENE	NA	0.8	0.8	0.8	NA	0.8000	0.0000
FLUORENE	NA	0.3	0.3	0.3	NA	0.3000	0.0000
PHENANTHRENE	NA	1.9	1.8	1.9	NA	1.8667	0.0471
ANTHRACENE	NA	0.1	0.3	0.3	NA	0.2333	0.0943
FLUORANTHENE	NA	2.1	2.4	2.5	NA	2.3333	0.1700
PYRENE	NA	2	2.6	2.8	NA	2.4667	0.3399
BENZO(a)ANTHRACENE	NA	0.2	0.4	0.4	NA	0.3333	0.0943
CHRYSENE	NA	0.2	0.5	0.6	NA	0.4333	0.1700
BENZO(b)FLUORANTHENE	NA	<0.2	0.3	0.4	NA	0.2333	0.1700
BENZO(k)FLUORANTHENE	NA	<0.1	0.4	0.5	NA	0.3000	0.2160
BENZO(a)PYRENE	NA	0.1	0.7	0.8	NA	0.5333	0.3091
PERYLENE	NA	0.1	0.1	0.1	NA	0.1000	0.0000
INDENO(1,2,3-C,D)PYRENE	NA	<0.1	0.2	0.4	NA	0.2000	0.1633
DIBENZO(a,h)ANTHRACENE	NA	<0.5	<0.5	0	NA	0.0000	0.0000
BENZO(g,h,i)PERYLENE	NA	<0.5	<0.5	0.5	NA	0.1667	0.2357
TOTAL PAHs	-	9.3	12.1	13.6	-	11.6667	1.7820

* All Units are mg/L unless otherwise specified.
NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	B5	B5	B5	B5	Average	Standard Deviation
SAMPLE DATE	88/08/29	88/11/20	89/03/08	89/05/31		
BAS REF NO.	8809032-04	8811120-5	880371-5	8906045-10		
SAMPLING LEVEL	1	2	2+	2+		
pH	12.50	12.57	12.71	12.4	12.5450	0.1128
SPECIFIC CONDUCTANCE (µS/cm)	4170	4090	5380	4350	4497.5000	518.1397
TEMPERATURE (°C)	13	10	6	9	9.5000	2.5000
DISSOLVED OXYGEN (ppm)	6.8	NA	0	0	2.2667	3.2056
DIC	NA	NA	NA	NA	-	-
ALKALINITY	NA	760/760	680	590/580	675.0000	71.5309
SULPHIDE	NA	NA	NA	NA	-	-
TOTAL CYANIDE	NA	NA	0.090	<0.002	0.0450	0.0450
BROMIDE	<2	<1/<1	<1	<1	0.0000	0.0000
CHLORIDE	90	83/84	154	186	128.3750	43.1963
FLUORIDE	0.75	1.4/1.2	0.60	0.2	0.7125	0.3943
SULPHATE	43	92/93	106	103	86.1250	25.3978
NITRATE-N	<0.2	0.20/<0.2	<0.2	<0.2	0.0250	0.0433
AMMONIA-N	NA	NA	NA	NA	-	-
TOTAL KJELDAHL NITROGEN	NA	NA	3.2	NA	3.2000	0.0000
TOTAL PHOSPHOROUS	NA	NA	<0.001	NA	0.0000	0.0000
DOC	3.5	4.0/4.0	NA	4.1	3.8667	0.2625
PHENOLS	0.008	0.004	0.005	0.005	0.0055	0.0015
PCB (µg/L)	NA	NA	NA	NA	-	-
OIL AND GREASE	2	NA	NA	NA	2.0000	0.0000
ZINC	0.01	NA	0.01	0.01	0.0067	0.0047
CADMIUM	0.0018	NA	<0.005	<0.005	0.0006	0.0008
MANGANESE	0.02	NA	<0.01	<0.01	0.0067	0.0094
COBALT	0.03	NA	<0.01	0.02	0.0167	0.0125
COPPER	0.005	NA	0.005	0.005	0.0033	0.0024
IRON	0.04	NA	0.02/0.02	0.02	0.0267	0.0094
LEAD	<0.05	NA	<0.05	<0.05	0.0000	0.0000
CHROMIUM	0.03	NA	0.01	0.02	0.0167	0.0125
NICKEL	0.02	NA	<0.01	<0.01	0.0067	0.0094
BERYLLIUM	NA	NA	<0.01	<0.01	0.0000	0.0000
MOLYBDENUM	NA	NA	0.04	0.03	0.0350	0.0050
CALCIUM	NA	400	330	320	350.0000	35.5903
VANADIUM	NA	NA	0.03	<0.01	0.0150	0.0150
ALUMINUM	NA	NA	0.44	0.46	0.4500	0.0100
MAGNESIUM	NA	0.25	0.05	0.15	0.1500	0.0816
BARIUM	NA	NA	0.2	0.2	0.2000	0.0000
POTASSIUM	NA	60	58	43	53.6667	7.5865
STRONTIUM	NA	NA	1.16	1.2	1.1800	0.0200
SODIUM	NA	32	53	48	44.3333	8.9567
ARSENIC (µg/L)	NA	NA	NA	NA	-	-
SELENIUM (µg/L)	NA	NA	NA	NA	-	-
MERCURY (µg/L)	NA	NA	NA	NA	-	-
CATION EQUIVALENCE	0.00	22.91	20.31	19.22		
ANION EQUIVALENCE	11.88	0.00	13.34	13.24		
CHARGE BALANCE ERROR	-99.98	100.00	20.69	18.44		
BTX (µg/L)						
BENZENE	NA	NA	<10/<10	NA	0.0000	0.0000
TOLUENE	NA	NA	29/18	NA	23.5000	0.0000
XYLENE	NA	NA	<10/37	NA	18.5000	0.0000
TOTAL BTX	-	-	29/55	-	42.0000	0.0000

Appendix 6: Groundwater

PIEZOMETER	B5	B5	B5	B5	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE	NA	NA	1.5	0.9	1.2000	0.3000
ACENAPHTHYLENE	NA	NA	0.1	<0.1	0.0500	0.0500
ACENAPHTHENE	NA	NA	1.1	0.9	1.0000	0.1000
FLUORENE	NA	NA	0.4	0.3	0.3500	0.0500
PHENANTHRENE	NA	NA	2.6	2	2.3000	0.3000
ANTHRACENE	NA	NA	0.4	0.2	0.3000	0.1000
FLUORANTHENE	NA	NA	3.3	2.4	2.8500	0.4500
PYRENE	NA	NA	3.1	2.3	2.7000	0.4000
BENZO(a)ANTHRACENE	NA	NA	0.2	<0.2	0.1000	0.1000
CHRYSENE	NA	NA	0.3	0.2	0.2500	0.0500
BENZO(b)FLUORANTHENE	NA	NA	<0.2	<0.2	0.0000	0.0000
BENZO(k)FLUORANTHENE	NA	NA	<0.1	<0.2	0.0000	0.0000
BENZO(a)PYRENE	NA	NA	<0.1	<0.5	0.0000	0.0000
PERYLENE	NA	NA	<0.1	<0.5	0.0000	0.0000
INDENO(1,2,3-C,D)PYRENE	NA	NA	<0.1	<0.5	0.0000	0.0000
DIBENZO(a,h)ANTHRACENE	NA	NA	<0.5	<0.5	0.0000	0.0000
BENZO(g,h,i)PERYLENE	NA	NA	<0.5	<0.5	0.0000	0.0000
TOTAL PAHs	-	-	13	9.2	11.1000	1.9000

* All Units are mg/L unless otherwise specified.
NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	C1	C1	C1	C1	Average	Standard Deviation
SAMPLE DATE	88/08/09	88/11/20	89/03/10	89/05/30		
BAS REF NO.	8808054-01	8811120-6	890377-5	8906008-3		
SAMPLING LEVEL	1	1	1	1		
pH	9.23	8.65	8.10	8.20	8.5450	0.4465
SPECIFIC CONDUCTANCE (µS/cm)	2740	4910	6370	2910	4232.5000	1500.3729
TEMPERATURE (°C)	14	13	10	13	12.5000	1.5000
DISSOLVED OXYGEN (ppm)	4	NA	5.15	3.4	4.1833	0.7261
DIC	NA	NA	NA	NA	-	-
ALKALINITY	NA	76	108/109	105	96.5000	14.5659
SULPHIDE	NA	NA	NA	NA	-	-
TOTAL CYANIDE	NA	NA	NA	NA	-	-
BROMIDE	<2	<1	<1	<1	0.0000	0.0000
CHLORIDE	19.0	17	19.0	14.2	17.3000	1.9672
FLUORIDE	1.25	1.8	6.2	0.6	2.4625	2.1993
SULPHATE	2400	2100	2300	2100	2225.0000	129.9038
NITRATE-N	<0.5	<0.2	<0.2	0.2	0.0500	0.0866
AMMONIA-N	NA	NA	NA	NA	-	-
TOTAL KJELDAHL NITROGEN	NA	NA	NA	NA	-	-
TOTAL PHOSPHOROUS	NA	NA	NA	NA	-	-
DOC	17.5	7	8.3	6.8	9.9000	4.4255
PHENOLS	0.005	0.002	<0.001	0.004	0.0028	0.0019
PCB (µg/L)	NA	NA	NA	NA	-	-
OIL AND GREASE	6	NA	NA	NA	6.0000	0.0000
ZINC	0.02	NA	NA	NA	0.0200	0.0000
CADMIUM	0.0010	NA	NA	NA	0.0010	0.0000
MANGANESE	0.72	NA	NA	NA	0.7200	0.0000
COBALT	0.03	NA	NA	NA	0.0300	0.0000
COPPER	<0.005	NA	NA	NA	0.0000	0.0000
IRON	0.12	NA	NA	NA	0.1200	0.0000
LEAD	<0.05	NA	NA	NA	0.0000	0.0000
CHROMIUM	0.04	NA	NA	NA	0.0400	0.0000
NICKEL	0.02	NA	NA	NA	0.0200	0.0000
BERYLLIUM	NA	NA	NA	NA	-	-
MOLYBDENUM	NA	NA	NA	NA	-	-
CALCIUM	NA	500/490	550	490	511.6667	27.1825
VANADIUM	NA	NA	NA	NA	-	-
ALUMINUM	NA	NA	NA	NA	-	-
MAGNESIUM	NA	56	59	53	56.0000	2.4495
BARIUM	NA	NA	NA	NA	-	-
POTASSIUM	NA	520	690	380	530.0000	126.7544
STRONTIUM	NA	NA	NA	NA	-	-
SODIUM	NA	101	139	86	108.6667	22.3060
ARSENIC (µg/L)	NA	NA	NA	NA	-	-
SELENIUM (µg/L)	NA	NA	NA	NA	-	-
MERCURY (µg/L)	NA	NA	NA	NA	-	-
CATION EQUIVALENCE	0.00	47.00	55.99	42.27		
ANION EQUIVALENCE	50.50	44.96	49.51	45.18		
CHARGE BALANCE ERROR	-99.98	2.22	6.15	-3.32		
BTX (µg/L)						
BENZENE	NA	NA	NA	NA	-	-
TOLUENE	NA	NA	NA	NA	-	-
XYLENE	NA	NA	NA	NA	-	-
TOTAL BTX	-	-	-	-	-	-

Appendix 6: Groundwater

PIEZOMETER	C1	C1	C1	C1	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE	NA	NA	NA	NA	-	-
ACENAPHTHYLENE	NA	NA	NA	NA	-	-
ACENAPHTHENE	NA	NA	NA	NA	-	-
FLUORENE	NA	NA	NA	NA	-	-
PHENANTHRENE	NA	NA	NA	NA	-	-
ANTHRACENE	NA	NA	NA	NA	-	-
FLUORANTHENE	NA	NA	NA	NA	-	-
PYRENE	NA	NA	NA	NA	-	-
BENZO(a)ANTHRACENE	NA	NA	NA	NA	-	-
CHRYSENE	NA	NA	NA	NA	-	-
BENZO(b)FLUORANTHENE	NA	NA	NA	NA	-	-
BENZO(k)FLUORANTHENE	NA	NA	NA	NA	-	-
BENZO(a)PYRENE	NA	NA	NA	NA	-	-
PERYLENE	NA	NA	NA	NA	-	-
INDENO(1,2,3-C,D)PYRENE	NA	NA	NA	NA	-	-
DIBENZO(a,h)ANTHRACENE	NA	NA	NA	NA	-	-
BENZO(g,h,i)PERYLENE	NA	NA	NA	NA	-	-
TOTAL PAHs	-	-	-	-	-	-

* All Units are mg/L unless otherwise specified.
NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	C2-1	C2-1	C2-1	C2-1	Average	Standard Deviation
SAMPLE DATE	08/10/88	88/11/17	89/03/10	89/05/31		
BAS REF NO.	8808064-02	8811120-7	890377-6	8906045-1		
SAMPLING LEVEL	1	1	1	1		
pH	7.00	7.20	7.06	7.31	7.1425	0.1209
SPECIFIC CONDUCTANCE (µS/cm)	1710	2840	3640	3310	2875.0000	730.2226
TEMPERATURE (°C)	16	10	9	12	11.7500	2.6810
DISSOLVED OXYGEN (ppm)	7	NA	6.1	7.5	6.8667	0.5793
DIC	NA	NA	NA	NA	-	-
ALKALINITY	NA	174	176	165	171.6667	4.7842
SULPHIDE	NA	NA	NA	NA	-	-
TOTAL CYANIDE	NA	NA	NA	NA	-	-
BROMIDE	<0.2	<0.5	<1	<1	0.0000	0.0000
CHLORIDE	33	2.5	25	26	21.6250	11.4639
FLUORIDE	1.0	1.25	0.80	0.2	0.8125	0.3879
SULPHATE	260	1260	1270	1400	1047.5000	458.0052
NITRATE-N	<0.2	<0.1	<0.2	<0.2	0.0000	0.0000
AMMONIA-N	NA	NA	NA	NA	-	-
TOTAL KJELDAHL NITROGEN	NA	NA	NA	NA	-	-
TOTAL PHOSPHOROUS	NA	NA	NA	NA	-	-
DOC	6.0/6.5	6.5	6.4	6.2	6.3375	0.1192
PHENOLS	<0.001	<0.001	<0.001	<0.001	0.0000	0.0000
PCB (µg/L)	NA	NA	NA	NA	-	-
OIL AND GREASE	3	NA	NA	NA	3.0000	0.0000
ZINC	0.02	NA	NA	NA	0.0200	0.0000
CADMIUM	0.0020	NA	NA	NA	0.0020	-
MANGANESE	3.4	NA	NA	NA	3.4000	-
COBALT	0.04	NA	NA	NA	0.0400	0.0000
COPPER	0.005	NA	NA	NA	0.0050	0.0000
IRON	0.64	NA	NA	NA	0.6400	0.0000
LEAD	<0.05	NA	NA	NA	0.0000	0.0000
CHROMIUM	0.02	NA	NA	NA	0.0200	0.0000
NICKEL	0.02	NA	NA	NA	0.0200	0.0000
BERYLLIUM	NA	NA	NA	NA	-	-
MOLYBDENUM	NA	NA	NA	NA	-	-
CALCIUM	NA	370	400	340	370.0000	24.4949
VANADIUM	NA	NA	NA	NA	-	-
ALUMINUM	NA	NA	NA	NA	-	-
MAGNESIUM	NA	89/88	89	90	89.1667	0.6236
BARIUM	NA	NA	NA	NA	-	-
POTASSIUM	NA	19.0/21	22	24	22.0000	1.6330
STRONTIUM	NA	NA	NA	NA	-	-
SODIUM	NA	92/93	151	145	129.5000	26.2774
ARSENIC (µg/L)	NA	NA	NA	NA	-	-
SELENIUM (µg/L)	NA	NA	NA	NA	-	-
MERCURY (µg/L)	NA	NA	NA	NA	-	-
CATION EQUIVALENCE	0.02	30.28	34.41	31.29		
ANION EQUIVALENCE	6.34	28.04	28.91	31.53		
CHARGE BALANCE ERROR	-99.28	3.83	8.70	-0.38		
BTX (µg/L)						
BENZENE	NA	NA	NA	NA	-	-
TOLUENE	NA	NA	NA	NA	-	-
XYLENE	NA	NA	NA	NA	-	-
TOTAL BTX	-	-	-	-	-	-

Appendix 6: Groundwater

PIEZOMETER	C2-1	C2-1	C2-1	C2-1	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE	NA	NA	NA	NA	-	-
ACENAPHTHYLENE	NA	NA	NA	NA	-	-
ACENAPHTHENE	NA	NA	NA	NA	-	-
FLUORENE	NA	NA	NA	NA	-	-
PHENANTHRENE	NA	NA	NA	NA	-	-
ANTHRACENE	NA	NA	NA	NA	-	-
FLUORANTHENE	NA	NA	NA	NA	-	-
PYRENE	NA	NA	NA	NA	-	-
BENZO(a)ANTHRACENE	NA	NA	NA	NA	-	-
CHRYSENE	NA	NA	NA	NA	-	-
BENZO(b)FLUORANTHENE	NA	NA	NA	NA	-	-
BENZO(k)FLUORANTHENE	NA	NA	NA	NA	-	-
BENZO(a)PYRENE	NA	NA	NA	NA	-	-
PERYLENE	NA	NA	NA	NA	-	-
INDENO(1,2,3-C,D)PYRENE	NA	NA	NA	NA	-	-
DIBENZO(a,h)ANTHRACENE	NA	NA	NA	NA	-	-
BENZO(g,h,i)PERYLENE	NA	NA	NA	NA	-	-
TOTAL PAHs	-	-	-	-	-	-

* All Units are mg/L unless otherwise specified.

NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	C2-2	C2-2	C2-2
SAMPLE DATE	DRY	DRY	DRY
BAS REF NO.			
SAMPLING LEVEL			

Appendix 6: Groundwater

PIEZOMETER	C3	C3	C3	GWREP1 (C3)	C3	Average	Standard Deviation
SAMPLE DATE	88/08/09	88/11/17	89/03/08	89/03/08	89/05/31		
BAS REF NO.	8808054-02	8811092-2	880371-1	890371-2	8906045-2		
SAMPLING LEVEL	1	1	1	1	1		
pH	11.57	11.47	12.16	NA	11.97	11.7925	0.2829
SPECIFIC CONDUCTANCE (µS/cm)	750	1160	1720	NA	1910	1095.2900	769.7988
TEMPERATURE (°C)	12.5	8	7	NA	11	9.6250	2.2185
DISSOLVED OXYGEN (ppm)	9.6	NA	0.25	2.85	5.1	4.4500	3.4331
DIC	NA	NA	NA	NA	NA	-	-
ALKALINITY	NA	117	240	230	250	209.2500	53.7279
SULPHIDE	NA	NA	NA	NA	NA	-	-
TOTAL CYANIDE	NA	NA	NA	NA	NA	-	-
BROMIDE	<0.5	<0.2	<0.2	<0.2	<0.5/<0.5	0.0000	0.0000
CHLORIDE	28	28	41	43	34/34	34.8000	6.3056
FLUORIDE	2.70	1.64	3.3	3.4	5.4/5.1	3.2580	1.1764
SULPHATE	130	310	104	105	125/126	154.9000	78.2575
NITRATE-N	<0.2	0.32	<0.05	<0.05	<0.1/<0.1	0.0640	0.1280
AMMONIA-N	NA	NA	NA	NA	NA	-	-
TOTAL KJELDAHL NITROGEN	NA	NA	NA	NA	NA	-	-
TOTAL PHOSPHOROUS	NA	NA	NA	NA	NA	-	-
DOC	29/30	20	94/94	97	101	68.3000	35.7542
PHENOLS	0.4	0.053	0.29	0.3	0.129	0.2344	0.1256
PCB (µg/L)	NA	NA	NA	NA	NA	-	-
OIL AND GREASE	9	NA	NA	NA	NA	9.0000	0.0000
ZINC	0.01	NA	NA	NA	NA	0.0100	0.0000
CADMIUM	0.0004	NA	NA	NA	NA	0.0004	0.0000
MANGANESE	<0.01	NA	NA	NA	NA	0.0000	0.0000
COBALT	0.01	NA	NA	NA	NA	0.0100	0.0000
COPPER	<0.005	NA	NA	NA	NA	0.0000	0.0000
IRON	0.02	NA	NA	NA	NA	0.0200	0.0000
LEAD	<0.05	NA	NA	NA	NA	0.0000	0.0000
CHROMIUM	0.01	NA	NA	NA	NA	0.0100	0.0000
NICKEL	0.01	NA	NA	NA	NA	0.0100	0.0000
BERYLLIUM	NA	NA	NA	NA	NA	-	-
MOLYBDENUM	NA	NA	NA	NA	NA	-	-
CALCIUM	NA	112	114/115	NA	145	126.6250	13.8626
VANADIUM	NA	NA	NA	NA	NA	-	-
ALUMINUM	NA	NA	NA	NA	NA	-	-
MAGNESIUM	NA	0.5	0.010/0.15	NA	0.2	0.2013	0.1827
BARIUM	NA	NA	NA	NA	NA	-	-
POTASSIUM	NA	71	37/38	NA	46	49.1250	12.9826
STRONTIUM	NA	NA	NA	NA	NA	-	-
SODIUM	NA	53	29/30	NA	28	35.8750	10.0522
ARSENIC (µg/L)	NA	NA	NA	NA	NA	-	-
SELENIUM (µg/L)	NA	NA	NA	NA	NA	-	-
MERCURY (µg/L)	NA	NA	NA	NA	NA	-	-
CATION EQUIVALENCE	0.00	9.75	7.96	0.00	9.65		
ANION EQUIVALENCE	3.50	8.42	5.72	5.70	6.07		
CHARGE BALANCE ERROR	-99.96	7.34	16.39	-100.00	22.76		
BTX (µg/L)							
BENZENE	NA	NA	NA	NA	NA	-	-
TOLUENE	NA	NA	NA	NA	NA	-	-
XYLENE	NA	NA	NA	NA	NA	-	-
TOTAL BTX	-	-	-	-	-	-	-

Appendix 6: Groundwater

PIEZOMETER	C3	C3	C3	GWREP1	C3	Average	Standard Deviation
PAHs (µg/L)							
NAPHTHALENE	NA	NA	NA	NA	NA	0.0000	0.0000
ACENAPHTHYLENE	NA	NA	NA	NA	NA	0.0000	0.0000
ACENAPHTHENE	NA	NA	NA	NA	NA	0.0000	0.0000
FLUORENE	NA	NA	NA	NA	NA	0.1000	0.0000
PHENANTHRENE	NA	NA	NA	NA	NA	0.1000	0.0000
ANTHRACENE	NA	NA	NA	NA	NA	0.0000	0.0000
FLUORANTHENE	NA	NA	NA	NA	NA	0.2000	0.0000
PYRENE	NA	NA	NA	NA	NA	0.3000	0.0000
BENZO(a)ANTHRACENE	NA	NA	NA	NA	NA	0.0000	0.0000
CHRYSENE	NA	NA	NA	NA	NA	0.0000	0.0000
BENZO(b)FLUORANTHENE	NA	NA	NA	NA	NA	0.0000	0.0000
BENZO(k)FLUORANTHENE	NA	NA	NA	NA	NA	0.0000	0.0000
BENZO(a)PYRENE	NA	NA	NA	NA	NA	0.0000	0.0000
PERYLENE	NA	NA	NA	NA	NA	0.0000	0.0000
INDENO(1,2,3-C,D)PYRENE	NA	NA	NA	NA	NA	0.0000	0.0000
DIBENZO(a,h)ANTHRACENE	NA	NA	NA	NA	NA	0.0000	0.0000
BENZO(g,h,i)PERYLENE	NA	NA	NA	NA	NA	0.0000	0.0000
TOTAL PAHs	-	-	-	-	-	-	-

* All Units are mg/L unless otherwise specified.
NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	C4	C4	C4	C4	Average	Standard Deviation
SAMPLE DATE	88/08/10	88/11/20	89/03/08	89/05/31		
BAS REF NO.	8808065-05	8811120-11	890371-9	8906046-1		
SAMPLING LEVEL	3	3	3	3		
pH	9.07	8.18	9.02	8.61	8.7200	0.3592
SPECIFIC CONDUCTANCE (µS/cm)	1480	2360	2810	2230	1630.5900	1051.6785
TEMPERATURE (°C)	12	10	4	10	9.0000	3.0000
DISSOLVED OXYGEN (ppm)	NA	NA	2.4	5.2	3.8000	1.4000
DIC	37	80	39	50	51.5000	17.1828
ALKALINITY	126	320	159/159	197	200.5000	73.4251
SULPHIDE	32	NA	0.04	<0.05	10.6800	15.0755
TOTAL CYANIDE	0.043	0.07	0.059	0.02	0.0480	0.0188
BROMIDE	<0.50	<1	<1	<0.5	0.0000	0.0000
CHLORIDE	460	280	470	330	385.0000	82.0061
FLUORIDE	1.50/1.50	2.4	1.40	1.4	1.6750	0.4206
SULPHATE	230/230	320	240	240	257.5000	36.3146
NITRATE-N	<0.10	<0.2	<0.2	<0.1	0.0000	0.0000
AMMONIA-N	0.02	0.13	0.28	0.156	0.1465	0.0924
TOTAL KJELDAHL NITROGEN	0.57	0.69	0.72	0.79	0.6925	0.0795
TOTAL PHOSPHOROUS	0.031	0.11	0.018	0.02	0.0448	0.0380
DOC	26	22	31	26	26.2500	3.1918
PHENOLS	0.005	<0.001	0.005	0.005	0.0038	0.0022
PCB (µg/L)	<0.1	NA	<0.02	<0.02	0.0000	0.0000
OIL AND GREASE	NA	NA	NA	NA	-	-
ZINC	0.02	0.08	0.01	0.03	0.0350	0.0269
CADMIUM	0.0004	<0.005	<0.005	<0.005	0.0001	0.0002
MANGANESE	0.16	0.46	0.37	0.28	0.3175	0.1110
COBALT	<0.01	<0.01	<0.01	<0.01	0.0000	0.0000
COPPER	<0.005	0.01	<0.005	0.005	0.0038	0.0041
IRON	0.06	0.42	0.22	0.26	0.2400	0.1281
LEAD	<0.05	<0.05	<0.05	<0.05	0.0000	0.0000
CHROMIUM	<0.01	<0.01	<0.01	<0.01	0.0000	0.0000
NICKEL	<0.01	<0.01	<0.01	<0.01	0.0000	0.0000
BERYLLIUM	<0.01	<0.01	<0.01	<0.01	0.0000	0.0000
MOLYBDENUM	0.06/0.06	0.06	0.06	0.06	0.0600	0.0000
CALCIUM	74/76	82	68	53	69.5000	10.7355
VANADIUM	0.02/0.01	<0.01	<0.01	<0.01	0.0038	0.0065
ALUMINUM	0.14/0.14	0.16	0.08	0.04	0.1050	0.0477
MAGNESIUM	40/39	87	59	52	59.3750	17.4118
BARIUM	0.06/0.06	0.04	0.04	0.03	0.0425	0.0109
POTASSIUM	46	52	52	45	48.7500	3.2692
STRONTIUM	0.37/0.38	0.44	0.40	0.3	0.3788	0.0510
SODIUM	250	186	300	220	239.0000	41.8688
ARSENIC (µg/L)	3	5/4	8	7/10	6.0000	2.3184
SELENIUM (µg/L)	<1	<1/<2	<1	<1/<2	0.0000	0.0000
MERCURY (µg/L)	<0.05	0.05	0.20	0.35	0.1500	0.1369
CATION EQUIVALENCE	19.06	20.70	22.64	17.66		
ANION EQUIVALENCE	19.02	17.76	19.84	16.27		
CHARGE BALANCE ERROR	0.10	7.66	6.59	4.08		
BTX (µg/L)						
BENZENE	NA	<2	230	<2	76.6667	108.4230
TOLUENE	NA	<1	57	1	19.3333	26.6375
XYLENE	NA	<2	188	3	63.6667	87.9255
TOTAL BTX	-	0	475	4	159.6667	222.9803

Appendix 6: Groundwater

PIEZOMETER	C4	C4	C4	C4	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE	0.73	<0.1	22	0.4	5.7825	9.3667
ACENAPHTHYLENE	0.28	<0.1	12	5	4.3200	4.8587
ACENAPHTHENE	0.14	<0.1	3.0	2.6	1.4350	1.3732
FLUORENE	0.53	<0.1	7.1	5.7	3.3325	3.1128
PHENANTHRENE	1.59	<0.1	11	0.4	3.2475	4.5140
ANTHRACENE	0.87	0.3	2.2	1.4	1.1925	0.6998
FLUORANTHENE	6.6	0.2	3.6	2.6	3.2500	2.2951
PYRENE	3.7	0.2	2.6	1.9	2.1000	1.2708
BENZO(a)ANTHRACENE	1.19	<0.1	0.5	0.3	0.4975	0.4376
CHRYSENE	1.3	<0.1	0.6	0.3	0.5500	0.4822
BENZO(b)FLUORANTHENE	0.87	<0.2	0.4	<0.2	0.3175	0.3584
BENZO(k)FLUORANTHENE	0.51	<0.1	0.5	<0.2	0.2525	0.2525
BENZO(a)PYRENE	0.53	<0.1	0.7	<0.5	0.3075	0.3133
PERYLENE	0.12	<0.1	0.1	<0.5	0.0550	0.0555
INDENO(1,2,3-C,D)PYRENE	0.43	<0.1	0.3	<0.5	0.1825	0.1882
DIBENZO(a,h)ANTHRACENE	0.15	<0.5	<0.5	<0.5	0.0375	0.0650
BENZO(g,h,i)PERYLENE	0.47	<0.5	<0.5	<0.5	0.1175	0.2035
TOTAL PAHs	20.01	0.7	66.6	20.6	26.9775	24.2367

Appendix 6: Groundwater

PIEZOMETER	D1-1	D1-1	D1-1	D1-1	Average	Standard Deviation
SAMPLE DATE	88/08/10	88/11/17	89/03/07	89/05/31		
BAS REF NO.	8808064-03	8811092-7	880371-7	8906008-10		
SAMPLING LEVEL	1	2+	2+	2+		
pH	7.14	7.20	7.16	8.09	7.3975	0.4004
SPECIFIC CONDUCTANCE (µS/cm)	1240	2040	2330	2150	1940.0000	417.1930
TEMPERATURE (°C)	13	8	7	11	9.7500	2.3848
DISSOLVED OXYGEN	4	NA	1.1	1.2	2.1000	1.3441
DIC	NA	NA	NA	NA	-	-
ALKALINITY	NA	139	133	126/124	132.3333	5.7349
SULPHIDE	NA	NA	NA	NA	-	-
TOTAL CYANIDE	NA	<0.002	<0.005	<0.002	0.0000	0.0000
BROMIDE	<1/<1	<1	<1	<1	0.0000	0.0000
CHLORIDE	350/350	380	410	390	382.5000	21.6506
FLUORIDE	0.60	1.8	0.20	0.4	0.7500	0.6225
SULPHATE	220/220	210	186	192	202.0000	13.6382
NITRATE-N	0.20/<0.4	<0.2	<0.2	<0.2	0.0250	0.0433
AMMONIA-N	NA	NA	NA	NA	-	-
TOTAL KJELDAHL NITROGEN	NA	1.17	NA	NA	1.1700	0.0000
TOTAL PHOSPHOROUS	NA	0.22	NA	NA	0.2200	0.0000
DOC	14.0	NA	NA	11.6/11.4	12.7500	1.2500
PHENOLS	0.001	0.001	<0.001	0.001	0.0005	0.0005
PCB (µg/L)	NA	0.012	<0.1	<0.02	0.0040	0.0057
OIL AND GREASE	4	NA	NA	NA	4.0000	0.0000
ZINC	0.02	NA	0.02	0.01	0.0167	0.0047
CADMIUM	0.0026	NA	<0.005	<0.005	0.0009	0.0012
MANGANESE	3.9	NA	5.7/5.5	5.1	4.8667	0.7134
COBALT	0.02	NA	<0.01	0.01	0.0100	0.0082
COPPER	0.005	NA	0.005	0.01	0.0067	0.0024
IRON	0.04	NA	1.18	1.04	0.7533	0.5076
LEAD	<0.05	NA	<0.05	<0.05	0.0000	0.0000
CHROMIUM	0.02	NA	0.01	0.02	0.0167	0.0047
NICKEL	0.01	NA	0.01	0.01	0.0100	0.0000
BERYLLIUM	NA	NA	<0.01	<0.02	0.0000	0.0000
MOLYBDENUM	NA	NA	0.04	<0.02	0.0200	0.0200
CALCIUM	NA	240	230/230	210	226.6667	12.4722
VANADIUM	NA	NA	0.02	0.02	0.0200	0.0000
ALUMINUM	NA	NA	0.30	0.2	0.2500	0.0500
MAGNESIUM	NA	25	27	26	26.0000	0.8165
BARIUM	NA	NA	0.12	0.1	0.1100	0.0100
POTASSIUM	NA	27	29/28	28	27.8333	0.6236
STRONTIUM	NA	NA	1.40	1.29	1.3450	0.0550
SODIUM	NA	65	64	60	63.0000	2.1602
ARSENIC (µg/L)	NA	NA	NA	NA	-	-
SELENIUM (µg/L)	NA	NA	NA	NA	-	-
MERCURY (µg/L)	NA	NA	NA	NA	-	-
CATION EQUIVALENCE	0.00	17.55	17.29	16.00		
ANION EQUIVALENCE	14.46	16.48	16.77	16.25		
CHARGE BALANCE ERROR	-99.98	3.15	1.53	-0.76		
BTX (µg/L)						
BENZENE	NA	7	NA	NA	7.0000	0.0000
TOLUENE	NA	<1	NA	NA	0.0000	0.0000
XYLENE	NA	<2	NA	NA	0.0000	0.0000
TOTAL BTX	-	7	-	-	7.0000	0.0000

Appendix 6: Groundwater

PIEZOMETER	D1-1	D1-1	D1-1	D1-1	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE	NA	<0.1/<0.1	<0.1	NA	0.0000	0.0000
ACENAPHTHYLENE	NA	<0.1/<0.1	<0.1	NA	0.0000	0.0000
ACENAPHTHENE	NA	<0.1/<0.1	<0.1	NA	0.0000	0.0000
FLUORENE	NA	<0.1/<0.1	<0.1	NA	0.0000	0.0000
PHENANTHRENE	NA	<0.1/<0.1	<0.1	NA	0.0000	0.0000
ANTHRACENE	NA	<0.1/<0.1	<0.1	NA	0.0000	0.0000
FLUORANTHENE	NA	0.1/0.1	<0.1	NA	0.0500	0.0500
PYRENE	NA	<0.2/0.3	0.2	NA	0.1000	0.1000
BENZO(a)ANTHRACENE	NA	<0.1/<0.1	<0.1	NA	0.0000	0.0000
CHRYSENE	NA	<0.1/<0.1	<0.1	NA	0.0000	0.0000
BENZO(b)FLUORANTHENE	NA	<0.2/<0.2	<0.2	NA	0.0000	0.0000
BENZO(k)FLUORANTHENE	NA	<0.1/<0.1	<0.1	NA	0.0000	0.0000
BENZO(a)PYRENE	NA	<0.1/<0.1	<0.1	NA	0.0000	0.0000
PERYLENE	NA	<0.1/<0.1	<0.1	NA	0.0000	0.0000
INDENO(1,2,3-C,D)PYRENE	NA	<0.1/<0.1	<0.1	NA	0.0000	0.0000
DIBENZO(a,h)ANTHRACENE	NA	<0.5/<0.5	<0.5	NA	0.0000	0.0000
BENZO(g,h,i)PERYLENE	NA	<0.5/<0.5	<0.5	NA	0.0000	0.0000
TOTAL PAHs	-	0.1/0.4	0.2	-	0.2250	0.0250

* All Units are mg/L unless otherwise specified.

NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	D1-2	GWREP1 (D1-2)	GWREP2 (D1-2)	D1-2	D1-2	D1-2	Average	Standard Deviation
SAMPLE DATE	88/08/10	88/08/10	88/08/10	88/11/17	89/03/07	89/05/31		
BAS REF NO.	8808064-04	8808064-05	8808064-06	8811092-8	880371-8	8906008-11		
SAMPLING LEVEL	1	1	1	2+	2+	2+		
pH	12.15	12.15	12.15	12.28	12.65	12.26	12.2733	0.1769
SPECIFIC CONDUCTANCE (µS/cm)	1600	1600	1600	3190	1820	2760	2095.0000	639.2639
TEMPERATURE (°C)	NA	NA	NA	9	1	8	6.0000	3.5590
DISSOLVED OXYGEN	NA	NA	NA	NA	3.7	1.6	2.6500	1.0500
DIC	NA	NA	NA	NA	NA	NA	-	-
ALKALINITY	NA	NA	NA	400	270	330	333.3333	53.1246
SULPHIDE	NA	NA	NA	NA	NA	NA	-	-
TOTAL CYANIDE	NA	NA	NA	<0.002	<0.005	<0.002	0.0000	0.0000
BROMIDE	<1	<1	<1	<1/<1	<0.2	<1	0.0000	0.0000
CHLORIDE	230	200	153	220/220	16.6	220	173.2667	74.4497
FLUORIDE	0.50	0.75	0.75	0.75/0.75	0.72	0.8	0.7117	0.0975
SULPHATE	115	98	86	160/162	24	114	99.6667	41.0636
NITRATE-N	<0.5	<0.5	<0.5	<0.2/<0.2	0.2	<0.2	0.0333	0.0745
AMMONIA-N	NA	NA	NA	NA	NA	NA	-	-
TOTAL KJELDAHL NITROGEN	NA	NA	NA	1.13	NA	NA	1.1300	0.0000
TOTAL PHOSPHOROUS	NA	NA	NA	0.061	NA	NA	0.0610	0.0000
DOC	9.0	8.5/8.5	9.0	NA	NA	5.4	7.9750	1.5006
PHENOLS	0.007	0.008	0.008	0.005	0.003	0.005	0.0055	0.0028
PCB (µg/L)	NA	NA	NA	<0.02	<0.02	<0.02	0.0000	0.0000
OIL AND GREASE	2	1	3	NA	NA	NA	2.0000	0.8165
ZINC	0.01	0.01	0.02	NA	0.02	<0.01	0.0120	0.0075
CADMIUM	0.0014	0.0004	0.0006	NA	<0.005	<0.005	0.0005	0.0005
MANGANESE	0.01	<0.01	0.06	NA	<0.01	<0.01	0.0140	0.0233
COBALT	0.02	0.02	0.02	NA	<0.01	<0.01	0.0120	0.0098
COPPER	0.010	<0.005	<0.005	NA	<0.005	0.005	0.0030	0.0040
IRON	<0.02	<0.02	0.18	NA	0.04	0.02/0.02	0.0480	0.0676
LEAD	<0.05	<0.05	<0.05	NA	<0.05	<0.05	0.0000	0.0000
CHROMIUM	0.02	0.02	0.02	NA	0.01	0.01/0.02	0.0170	0.0040
NICKEL	0.02	0.01	0.01	NA	<0.01	0.01	0.0100	0.0063
BERYLLIUM	NA	NA	NA	NA	<0.01	<0.01	0.0000	0.0000
MOLYBDENUM	NA	NA	NA	NA	<0.02	<0.02	0.0000	0.0000
CALCIUM	NA	NA	NA	310	144	260	238.0000	69.5318
VANADIUM	NA	NA	NA	NA	0.03	0.04	0.0350	0.0050
ALUMINUM	NA	NA	NA	NA	0.28	0.28	0.2800	0.0000
MAGNESIUM	NA	NA	NA	1.4	0.15	0.2	0.5833	0.5778
BARIUM	NA	NA	NA	NA	0.06	0.12	0.0900	0.0300
POTASSIUM	NA	NA	NA	26	3.1	16.8	15.3000	9.4089
STRONTIUM	NA	NA	NA	NA	0.27	0.86	0.5650	0.2950
SODIUM	NA	NA	NA	43	6.0	38	29.0000	16.3911
ARSENIC (µg/L)	NA	NA	NA	NA	NA	NA	-	-
SELENIUM (µg/L)	NA	NA	NA	NA	NA	NA	-	-
MERCURY (µg/L)	NA	NA	NA	NA	NA	NA	-	-
CATION EQUIVALENCE	0.00	0.00	0.01	18.12	7.57	15.10		
ANION EQUIVALENCE	8.88	7.68	6.11	13.55	3.67	11.88		
CHARGE BALANCE ERROR	-100.00	-100.00	-99.79	14.41	34.72	11.97		
BTX (µg/L)								
BENZENE	NA	NA	NA	<2	NA	NA	0.0000	0.0000
TOLUENE	NA	NA	NA	<1	NA	NA	0.0000	0.0000
XYLENE	NA	NA	NA	<2	NA	NA	0.0000	0.0000
TOTAL BTX	-	-	-	0	-	-	0.0000	0.0000

Appendix 6: Groundwater

PIEZOMETER	D1-2	GWREP1	GWREP2	D1-2	D1-2	D1-2	Average	Standard Deviation
PAHs (µg/L)								
NAPHTHALENE	NA	NA	NA	1.0/0.6	<0.1/<0.1	NA	0.4000	0.4000
ACENAPHTHYLENE	NA	NA	NA	0.2/0.2	<0.1/<0.1	NA	0.1000	0.1000
ACENAPHTHENE	NA	NA	NA	0.7/0.7	0.4/0.5	NA	0.5750	0.1250
FLUORENE	NA	NA	NA	0.4/0.4	0.2/0.3	NA	0.3250	0.0750
PHENANTHRENE	NA	NA	NA	1.6/1.5	0.5/1.0	NA	1.1500	0.4000
ANTHRACENE	NA	NA	NA	0.2/0.2	0.1/0.2	NA	0.1750	0.0250
FLUORANTHENE	NA	NA	NA	1.4/1.5	0.9/1.2	NA	1.2500	0.2000
PYRENE	NA	NA	NA	1.3/1.2	0.9/1.2	NA	1.1500	0.1000
BENZO(a)ANTHRACENE	NA	NA	NA	<0.1/<0.1	<0.1/<0.1	NA	0.0000	0.0000
CHRYSENE	NA	NA	NA	0.1/0.1	0.1/0.1	NA	0.1000	0.0000
BENZO(b)FLUORANTHENE	NA	NA	NA	<0.2/<0.2	<0.2/<0.2	NA	0.0000	0.0000
BENZO(k)FLUORANTHENE	NA	NA	NA	<0.1/<0.1	<0.1/<0.1	NA	0.0000	0.0000
BENZO(a)PYRENE	NA	NA	NA	<0.1/<0.1	<0.1/<0.1	NA	0.0000	0.0000
PERYLENE	NA	NA	NA	<0.1/<0.1	<0.1/<0.1	NA	0.0000	0.0000
INDENO(1,2,3-C,D)PYRENE	NA	NA	NA	<0.1/<0.1	<0.1/<0.1	NA	0.0000	0.0000
DIBENZO(a,h)ANTHRACENE	NA	NA	NA	<0.5/<0.5	<0.5/<0.5	NA	0.0000	0.0000
BENZO(g,h,i)PERYLENE	NA	NA	NA	<0.5/<0.5	<0.5/<0.5	NA	0.0000	0.0000
TOTAL PAHs	-	-	-	6.9/6.4	3.1/4.5	-	5.2250	1.4250

* All Units are mg/L unless otherwise specified.
NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	D2	D2	D2	D2	GWREP1 (D2)	Average	Standard Deviation
SAMPLE DATE	88/08/09	88/11/19	89/03/07	89/05/30	89/05/30		
BAS REF NO.	8808054-03	8811095-3	880371-6	8906008-7	8808064-5		
SAMPLING LEVEL	1	1	2+	2+			
pH	11.83	12.31	12.39	12.06	NA	12.1475	0.2200
SPECIFIC CONDUCTANCE (µS/cm)	1740	2480	2710	2280	NA	2302.5000	358.6346
TEMPERATURE (°C)	12	9	6	9	NA	9.0000	2.1213
DISSOLVED OXYGEN (ppm)	3	NA	0.9	2.65	NA	2.1833	0.9186
DIC	NA	NA	NA	NA	NA	-	-
ALKALINITY	NA	280	280	210	NA	256.6667	32.9983
SULPHIDE	NA	NA	NA	NA	NA	-	-
TOTAL CYANIDE	NA	NA	0.28	0.038	NA	0.1590	0.1210
BROMIDE	<0.5	<1	<1	<0.5	NA	0.0000	0.0000
CHLORIDE	20	19	31	15.4	NA	21.3500	5.8282
FLUORIDE	1.10	1.2	0.80	0.55	NA	0.9125	0.2559
SULPHATE	320	430	370	440	NA	390.0000	48.4768
NITRATE-N	<0.2	0.2	<0.2	<0.1	NA	0.0500	0.0866
AMMONIA-N	NA	NA	NA	NA	NA	-	-
TOTAL KJELDAHL NITROGEN	NA	NA	2.3	NA	NA	2.3000	0.0000
TOTAL PHOSPHOROUS	NA	NA	0.004	NA	NA	0.0040	0.0000
DOC	4.5	4.5	NA	3.6	NA	4.2000	0.4243
PHENOLS	0.010	0.005	0.005	0.005	NA	0.0063	0.0022
PCB (µg/L)	NA	NA	NA	NA	NA	-	-
OIL AND GREASE	4	NA	NA	NA	NA	4.0000	0.0000
ZINC	<0.01	NA	<0.01	<0.01	NA	0.0000	0.0000
CADMIUM	0.0010	NA	<0.005	<0.005	NA	0.0003	0.0005
MANGANESE	<0.01	NA	<0.01	<0.01	NA	0.0000	0.0000
COBALT	0.02	NA	<0.01	<0.01	NA	0.0067	0.0094
COPPER	<0.005	NA	0.005	0.007	NA	0.0040	0.0029
IRON	<0.02	NA	0.04	0.04/0.04	NA	0.0267	0.0189
LEAD	<0.05	NA	<0.05	<0.05	NA	0.0000	0.0000
CHROMIUM	0.02	NA	<0.01	0.02/0.02	NA	0.0133	0.0094
NICKEL	0.01	NA	<0.01	<0.01	NA	0.0033	0.0047
BERYLLIUM	NA	NA	<0.01	<0.01	NA	0.0000	0.0000
MOLYBDENUM	NA	NA	0.06	0.04/0.04	NA	0.0500	0.0100
CALCIUM	NA	230	200	210	NA	213.3333	12.4722
VANADIUM	NA	NA	0.06	0.06/0.07	NA	0.0625	0.0025
ALUMINUM	NA	NA	0.30	0.26/0.24	NA	0.2750	0.0250
MAGNESIUM	NA	1.05	<0.05	0.2/0.25	NA	0.4250	0.4514
BARIUM	NA	NA	0.10	0.1/0.1	NA	0.1000	0.0000
POTASSIUM	NA	103	98	84	NA	95.0000	8.0416
STRONTIUM	NA	NA	1.19	1.12/1.14	NA	1.1600	0.0300
SODIUM	NA	40	47	35/36	NA	40.8333	4.7317
ARSENIC (µg/L)	NA	NA	NA	NA	NA	-	-
SELENIUM (µg/L)	NA	NA	NA	NA	NA	-	-
MERCURY (µg/L)	NA	NA	NA	NA	NA	-	-
CATION EQUIVALENCE	0.00	15.94	14.57	14.22	0.00		
ANION EQUIVALENCE	7.23	12.29	11.38	11.69	0.00		
CHARGE BALANCE ERROR	-100.00	12.92	12.30	9.75	-		
BTX (µg/L)							
BENZENE	NA	NA	25	NA	NA	25.0000	0.0000
TOLUENE	NA	NA	21	NA	NA	21.0000	0.0000
XYLENE	NA	NA	19	NA	NA	19.0000	0.0000
TOTAL BTX	-	-	65	-	-	65.0000	0.0000

Appendix 6: Groundwater

PIEZOMETER	D2	D2	D2	D2	GWREP1	Average	Standard Deviation
PAHs (µg/L)							
NAPHTHALENE	NA	NA	0.3	0.5	<0.1	0.2667	0.2055
ACENAPHTHYLENE	NA	NA	0.1	0.1	<0.1	0.0667	0.0471
ACENAPHTHENE	NA	NA	0.1	0.1	<0.1	0.0667	0.0471
FLUORENE	NA	NA	0.2	0.3	0.1	0.2000	0.0816
PHENANTHRENE	NA	NA	0.3	1.3	0.1	0.5667	0.5249
ANTHRACENE	NA	NA	<0.1	0.2	<0.1	0.0667	0.0943
FLUORANTHENE	NA	NA	0.4	1.4	0.2	0.6667	0.5249
PYRENE	NA	NA	0.3	1.1	0.3	0.5667	0.3771
BENZO(a)ANTHRACENE	NA	NA	<0.1	0.6	<0.2	0.2000	0.2828
CHRYSENE	NA	NA	<0.1	0.7	<0.2	0.2333	0.3300
BENZO(b)FLUORANTHENE	NA	NA	<0.2	1.5	<0.2	0.5000	0.7071
BENZO(k)FLUORANTHENE	NA	NA	<0.1	<0.2	<0.2	0.0000	0.0000
BENZO(a)PYRENE	NA	NA	<0.1	1.4	<0.5	0.4667	0.6600
PERYLENE	NA	NA	<0.1	<0.5	<0.5	0.0000	0.0000
INDENO(1,2,3-C,D)PYRENE	NA	NA	<0.1	<0.5	<0.5	0.0000	0.0000
DIBENZO(a,h)ANTHRACENE	NA	NA	<0.5	<0.5	<0.5	0.0000	0.0000
BENZO(g,h,i)PERYLENE	NA	NA	<0.5	<0.5	<0.5	0.0000	0.0000
TOTAL PAHs	-	-	1.7	9.2	0.7	3.8667	3.7933

* All Units are mg/L unless otherwise specified.
NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	D3-1	D3-1	D3-1	D3-1	Average	Standard Deviation
SAMPLE DATE	88/08/10	88/11/19	89/03/10	89/05/31		
BAS REF NO.	8808064-07	8811095-12	890377-7	8906045-9		
SAMPLING LEVEL	1	2+	2+	2		
pH	8.14	8.97	8.34	7.8	8.3125	0.4259
SPECIFIC CONDUCTANCE (µS/cm)	3020	4740	5950	5510	4805.0000	1117.8663
TEMPERATURE (°C)	12	9	8	10	9.7500	1.4790
DISSOLVED OXYGEN (ppm)	3.8	NA	0.45	5	3.0833	1.9254
DIC	NA	NA	NA	NA	-	-
ALKALINITY	NA	12	10	12	11.3333	0.9428
SULPHIDE	NA	NA	NA	NA	-	-
TOTAL CYANIDE	NA	<0.002	<0.005	<0.002	0.0000	0.0000
BROMIDE	<1	10.0/10.5	10	12/12	8.0625	4.7182
CHLORIDE	1280	1530	1500	1500	1452.5000	100.3432
FLUORIDE	1.5	1.5	1	1	1.2500	0.2500
SULPHATE	18/20	20	45	25	27.2500	10.4970
NITRATE-N	2.5/2.5	<0.5	<0.5	<0.5	0.6250	1.0825
AMMONIA-N	NA	NA	NA	NA	-	-
TOTAL KJELDAHL NITROGEN	NA	0.32	NA	NA	0.3200	0.0000
TOTAL PHOSPHOROUS	NA	0.3	NA	NA	0.3000	0.0000
DOC	<0.5	NA	NA	2.3	1.1500	1.1500
PHENOLS	<0.001	0.001	<0.001	<0.001	0.0003	0.0004
PCB (µg/L)	NA	NA	NA	NA	-	-
OIL AND GREASE	2	NA	NA	NA	2.0000	0.0000
ZINC	0.01/0.02	NA	0.02	0.02	0.0183	0.0024
CADMIUM	0.0004	NA	<0.005	<0.005	0.0001	0.0002
MANGANESE	0.20/0.20	NA	0.08	0.08	0.1200	0.0566
COBALT	0.04/0.04	NA	0.04	0.03	0.0367	0.0047
COPPER	<0.005	NA	0.005	0.01	0.0050	0.0041
IRON	0.26/0.26	NA	0.34	0.62	0.4067	0.1543
LEAD	<0.05	NA	<0.05	<0.05	0.0000	0.0000
CHROMIUM	0.02/0.02	NA	0.03	0.03	0.0267	0.0047
NICKEL	0.04/0.04	NA	0.02	0.02	0.0267	0.0094
BERYLLIUM	NA	NA	<0.01	<0.01	0.0000	0.0000
MOLYBDENUM	NA	NA	0.36	0.25	0.3050	0.0550
CALCIUM	NA	420	460	400	426.6667	24.9444
VANADIUM	NA	NA	0.03	<0.01	0.0150	0.0150
ALUMINUM	NA	NA	0.50	0.78	0.6400	0.1400
MAGNESIUM	NA	41	42	45	42.6667	1.6997
BARIUM	NA	NA	0.33	0.33	0.3300	0.0000
POTASSIUM	NA	29	31	26	28.6667	2.0548
STRONTIUM	NA	NA	10.7	9.8	10.2500	0.4500
SODIUM	NA	290	290	290	290.0000	0.0000
ARSENIC (µg/L)	NA	NA	NA	NA	-	-
SELENIUM (µg/L)	NA	NA	NA	NA	-	-
MERCURY (µg/L)	NA	NA	NA	NA	-	-
CATION EQUIVALENCE	0.01	37.69	39.88	37.05		
ANION EQUIVALENCE	36.54	43.70	43.35	42.95		
CHARGE BALANCE ERROR	-99.95	-7.38	-4.16	-7.38		
BTX (µg/L)						
BENZENE	NA	<2	NA	NA	0.0000	0.0000
TOLUENE	NA	11	NA	NA	11.0000	0.0000
XYLENE	NA	<2	NA	NA	0.0000	0.0000
TOTAL BTX	-	11	-	-	11.0000	0.0000

Appendix 6: Groundwater

PIEZOMETER	D3-1	D3-1	D3-1	D3-1	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE	NA	<0.1	<0.1	NA	0.0000	0.0000
ACENAPHTHYLENE	NA	<0.1	<0.1	NA	0.0000	0.0000
ACENAPHTHENE	NA	<0.1	<0.1	NA	0.0000	0.0000
FLUORENE	NA	<0.1	<0.1	NA	0.0000	0.0000
PHENANTHRENE	NA	<0.1	<0.1	NA	0.0000	0.0000
ANTHRACENE	NA	<0.1	<0.1	NA	0.0000	0.0000
FLUORANTHENE	NA	<0.1	<0.1	NA	0.0000	0.0000
PYRENE	NA	<0.1	<0.1	NA	0.0000	0.0000
BENZO(a)ANTHRACENE	NA	<0.1	<0.1	NA	0.0000	0.0000
CHRYSENE	NA	<0.1	<0.1	NA	0.0000	0.0000
BENZO(b)FLUORANTHENE	NA	<0.2	<0.2	NA	0.0000	0.0000
BENZO(k)FLUORANTHENE	NA	<0.1	<0.1	NA	0.0000	0.0000
BENZO(a)PYRENE	NA	<0.1	<0.1	NA	0.0000	0.0000
PERYLENE	NA	<0.1	<0.1	NA	0.0000	0.0000
INDENO(1,2,3-C,D)PYRENE	NA	<0.1	<0.1	NA	0.0000	0.0000
DIBENZO(a,h)ANTHRACENE	NA	<0.5	<0.5	NA	0.0000	0.0000
BENZO(g,h,i)PERYLENE	NA	<0.5	<0.5	NA	0.0000	0.0000
TOTAL PAHs	-	0	0	-	0.0000	0.0000

* All Units are mg/L unless otherwise specified.
NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	D3-2	D3-2	D3-2	D3-2	Average	Standard Deviation
SAMPLE DATE	88/08/10	88/11/17	89/03/10	89/05/31		
BAS REF NO.	8808065-03	8811092-10	890377-9	8906046-2		
SAMPLING LEVEL	2	3	3	3		
pH	11.58	11.71	11.92	11.42	11.6575	0.1831
SPECIFIC CONDUCTANCE (µS/cm)	900	1660	1750	1090	1350.0000	362.6982
TEMPERATURE (°C)	13	9	7	8	9.2500	2.2776
DISSOLVED OXYGEN	3.2	NA	0	0	1.0667	1.5085
DIC	6	NA	2.5	3.2	3.9000	1.5122
ALKALINITY	136	128	133	68	116.2500	28.0033
SULPHIDE	10.8	NA	0.05	<0.05	3.6167	5.0794
TOTAL CYANIDE	NA	1.38/1.41	2.6	1	1.6650	0.6805
BROMIDE	<0.05	<0.5	<0.5	<0.05	0.0000	0.0000
CHLORIDE	12.5/12.8	15.8	16.0	7.5	12.9875	3.4355
FLUORIDE	0.90/0.90	1	0.40	0.76	0.7650	0.2273
SULPHATE	280/280	430	390	270	342.5000	69.0561
NITRATE-N	<0.10	<0.1	<0.1	<0.01	0.0000	0.0000
AMMONIA-N	NA	5.4/5.4	4.0	3	4.1333	0.9843
TOTAL KJELDAHL NITROGEN	5.1	NA	6.20	4.1	5.1333	0.8576
TOTAL PHOSPHOROUS	NA	NA	0.014	0.023	0.0185	0.0045
DOC	7.0	12	12.9	6.2	9.5250	2.9558
PHENOLS	0.045	0.076	0.08	0.027	0.0570	0.0220
PCB (µg/L)	NA	<0.02	<0.02	<0.02	0.0000	0.0000
OIL AND GREASE	NA	NA	NA	NA	-	-
ZINC	<0.01	<0.01	<0.01	0.01	0.0025	0.0043
CADMIUM	0.0012	<0.005	<0.005	<0.005	0.0003	0.0005
MANGANESE	<0.01	<0.01	<0.01	<0.01	0.0000	0.0000
COBALT	0.01	<0.01	<0.01	<0.01	0.0025	0.0043
COPPER	<0.005	<0.005	<0.005	<0.005	0.0000	0.0000
IRON	0.48	0.8	0.94	0.46	0.6700	0.2062
LEAD	<0.05	<0.05	<0.05	<0.05	0.0000	0.0000
CHROMIUM	0.01	<0.01	<0.01	<0.01	0.0025	0.0043
NICKEL	<0.01	<0.01	<0.01	<0.01	0.0000	0.0000
BERYLLIUM	<0.01	<0.01	<0.01	<0.01	0.0000	0.0000
MOLYBDENUM	0.02	0.04	0.04	<0.02	0.0250	0.0166
CALCIUM	139	172	192	104	151.7500	33.4393
VANADIUM	0.05	0.04	0.03	0.04	0.0400	0.0071
ALUMINUM	0.80	0.72	0.66	0.34	0.6300	0.1746
MAGNESIUM	0.10	0.55	0.10	0.15	0.2250	0.1887
BARIUM	0.08	0.12	0.10	0.06	0.0900	0.0224
POTASSIUM	67	100	96	45	77.0000	22.4388
STRONTIUM	0.64	0.82	0.81	0.46	0.6825	0.1470
SODIUM	25	34	33	19.5	27.8750	5.9621
ARSENIC (µg/L)	NA	8/8	4	4	2.6667	1.8856
SELENIUM (µg/L)	NA	3/4	2	<1	0.6667	0.9428
MERCURY (µg/L)	NA	0.15/<0.1	<0.05	0.15	0.0525	0.0690
CATION EQUIVALENCE	9.85	12.77	13.59	7.26		
ANION EQUIVALENCE	7.55	10.68	9.90	6.51		
CHARGE BALANCE ERROR	13.26	8.94	15.70	5.40		
BTX (µg/L)						
BENZENE	NA	2	<10	<2/<2	0.6667	0.9428
TOLUENE	NA	<1	<10	<1/<1	0.0000	0.0000
XYLENE	NA	<2	<10	<2/<2	0.0000	0.0000
TOTAL BTX	-	2	0	0	0.6667	0.9428

Appendix 6: Groundwater

PIEZOMETER	D3-2	D3-2	D3-2	D3-2	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE	28	37	50/40	26	34.0000	7.5829
ACENAPHTHYLENE	0.74	1.9	2.6/1.9	0.9	1.4725	0.6740
ACENAPHTHENE	0.31	0.7	1.0/0.9	0.6	0.6400	0.2292
FLUORENE	0.45	0.9	1.3/1.1	0.8	0.8375	0.2678
PHENANTHRENE	1.34	1.5	3.0/1.8	1.4	1.7100	0.5170
ANTHRACENE	0.22	<0.1	7.0/0.3	0.3	1.0425	1.5094
FLUORANTHENE	1.02	0.6	2.0/0.8	0.7	0.9800	0.3901
PYRENE	0.83	0.6	2.6/1.2	0.7	1.0075	0.5217
BENZO(a)ANTHRACENE	0.13	<0.1	0.5/0.3	<0.2	0.1325	0.1633
CHRYSENE	0.19	<0.1	0.7/<0.1	<0.2	0.1350	0.1464
BENZO(b)FLUORANTHENE	0.1	<0.2	0.7/<0.2	<0.2	0.1125	0.1431
BENZO(k)FLUORANTHENE	<0.05	<0.1	0.4/<0.1	<0.2	0.0500	0.0866
BENZO(a)PYRENE	<0.05	<0.1	0.8/<0.1	<0.5	0.1000	0.1732
PERYLENE	<0.05	<0.1	<0.1/<0.1	<0.5	0.0000	0.0000
INDENO(1,2,3-C,D)PYRENE	<0.1	<0.1	0.5/<0.1	<0.5	0.0625	0.1083
DIBENZO(a,h)ANTHRACENE	<0.2	<0.5	<0.5/<0.5	<0.5	0.0000	0.0000
BENZO(g,h,i)PERYLENE	<0.1	<0.5	<0.5/<0.5	<0.5	0.0000	0.0000
TOTAL PAHs	33.33	43.2	73.1/48.3	31.4	42.1575	11.6034

* All Units are mg/L unless otherwise specified.
NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	D4	D4	D4	D4	Average	Standard Deviation
SAMPLE DATE	88/08/09	88/11/19	89/03/10	89/05/30		
BAS REF NO.	8808054-04	8811095-2	890378-4	8906008-8		
SAMPLING LEVEL	1	1	2+	2+		
pH	12.25	12.59	12.92	12.5	12.5650	0.2398
SPECIFIC CONDUCTANCE (µS/cm)	4000	5560	7950	6020	5882.5000	1409.0134
TEMPERATURE (°C)	12	9	7	8	9.0000	1.8708
DISSOLVED OXYGEN	2	NA	0	0	0.6667	0.9428
DIC	NA	NA	NA	NA	-	-
ALKALINITY	NA	650	690	670	670.0000	16.3299
SULPHIDE	NA	NA	NA	NA	-	-
TOTAL CYANIDE	NA	NA	0.065	<0.002	0.0325	0.0325
BROMIDE	<2	<1	<5	<1	0.0000	0.0000
CHLORIDE	28	59	71	55	53.2500	15.7222
FLUORIDE	0.50	<0.5	<1	1	0.3750	0.4146
SULPHATE	500	1100	1300	1190	1022.5000	309.8689
NITRATE-N	<1.0	<0.2	<1	<0.2	0.0000	0.0000
AMMONIA-N	NA	NA	NA	NA	-	-
TOTAL KJELDAHL NITROGEN	NA	NA	1.43	NA	1.4300	0.0000
TOTAL PHOSPHOROUS	NA	NA	0.001	NA	0.0010	0.0000
DOC	5.5	7.5	NA	5.8	6.2667	0.8807
PHENOLS	0.021	0.009	0.013	0.011	0.0135	0.0046
PCB (µg/L)	NA	NA	NA	NA	-	-
OIL AND GREASE	5	NA	NA	NA	5.0000	0.0000
ZINC	0.01	NA	<0.01	<0.01	0.0033	0.0047
CADMIUM	0.012	NA	<0.005	<0.005	0.0040	0.0057
MANGANESE	<0.01	NA	<0.01	<0.01	0.0000	0.0000
COBALT	0.03	NA	0.01	<0.01	0.0133	0.0125
COPPER	<0.005	NA	<0.005	0.005	0.0017	0.0024
IRON	<0.02	NA	0.02	0.04/0.04	0.0200	0.0163
LEAD	<0.05	NA	<0.05	<0.05	0.0000	0.0000
CHROMIUM	0.03	NA	0.02	0.03/0.03	0.0267	0.0047
NICKEL	0.02	NA	<0.01	0.02/0.01	0.0117	0.0085
BERYLLIUM	NA	NA	<0.01	<0.01	0.0000	0.0000
MOLYBDENUM	NA	NA	0.04	0.02	0.0300	0.0100
CALCIUM	NA	540	620	500	553.3333	49.8888
VANADIUM	NA	NA	0.05	0.05	0.0500	0.0000
ALUMINUM	NA	NA	0.46	0.34	0.4000	0.0600
MAGNESIUM	NA	2.4	0.15	0.15	0.9000	1.0607
BARIUM	NA	NA	0.08	0.08	0.0800	0.0000
POTASSIUM	NA	350	480	350	393.3333	61.2826
STRONTIUM	NA	NA	1.76	1.5	1.6300	0.1300
SODIUM	NA	100	135	105	113.3333	15.4560
ARSENIC (µg/L)	NA	NA	NA	NA	-	-
SELENIUM (µg/L)	NA	NA	NA	NA	-	-
MERCURY (µg/L)	NA	NA	NA	NA	-	-
CATION EQUIVALENCE	0.00	40.44	49.15	38.52		
ANION EQUIVALENCE	11.20	31.06	35.96	33.02		
CHARGE BALANCE ERROR	-100.00	13.12	15.49	7.69		
BTX (µg/L)						
BENZENE	NA	NA	<10	NA	0.0000	0.0000
TOLUENE	NA	NA	<10	NA	0.0000	0.0000
XYLENE	NA	NA	<10	NA	0.0000	0.0000
TOTAL BTX	-	-	0	-	0.0000	0.0000

Appendix 6: Groundwater

PIEZOMETER	D4	D4	D4	D4	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE	NA	NA	4.8	4.8	4.8000	0.0000
ACENAPHTHYLENE	NA	NA	0.1	0.2	0.1500	0.0500
ACENAPHTHENE	NA	NA	2.6	2.9	2.7500	0.1500
FLUORENE	NA	NA	1.2	1.4	1.3000	0.1000
PHENANTHRENE	NA	NA	2.5	3.4	2.9500	0.4500
ANTHRACENE	NA	NA	0.4	0.4	0.4000	0.0000
FLUORANTHENE	NA	NA	1.3	1.4	1.3500	0.0500
PYRENE	NA	NA	1	1.2	1.1000	0.1000
BENZO(a)ANTHRACENE	NA	NA	<0.1	0.2	0.1000	0.1000
CHRYSENE	NA	NA	<0.1	0.4	0.2000	0.2000
BENZO(b)FLUORANTHENE	NA	NA	<0.2	<0.2	0.0000	0.0000
BENZO(k)FLUORANTHENE	NA	NA	<0.1	<0.2	0.0000	0.0000
BENZO(a)PYRENE	NA	NA	<0.1	<0.5	0.0000	0.0000
PERYLENE	NA	NA	<0.1	<0.5	0.0000	0.0000
INDENO(1,2,3-C,D)PYRENE	NA	NA	<0.1	<0.5	0.0000	0.0000
DIBENZO(a,h)ANTHRACENE	NA	NA	<0.5	<0.5	0.0000	0.0000
BENZO(g,h,i)PERYLENE	NA	NA	<0.5	<0.5	0.0000	0.0000
TOTAL PAHs	-	-	13.9	16.3	15.1000	1.2000

* All Units are mg/L unless otherwise specified.

NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	D5-1	D5-1	D5-1	D5-1	Average	Standard Deviation
SAMPLE DATE	88/08/09	88/11/19	89/03/10	89/05/31		
BAS REF NO.	8808054-05	8811095-10	890378-1	8906045-7		
SAMPLING LEVEL	1	2+	2+	2		
pH	7.37	7.22	7.49	7.36	7.3600	0.0957
SPECIFIC CONDUCTANCE (µS/cm)	1320	2000	2590	2560	2117.5000	516.9321
TEMPERATURE (°C)	12.5	9	5	8	8.6250	2.6780
DISSOLVED OXYGEN	3.2	NA	4.9	0	2.7000	2.0314
DIC	NA	NA	NA	NA	-	-
ALKALINITY	NA	100	84	59	81.0000	16.8721
SULPHIDE	NA	NA	NA	NA	-	-
TOTAL CYANIDE	NA	<0.002	0.93/0.92	0.008	0.3110	0.4342
BROMIDE	<0.5	1	6	<0.5	1.7500	2.4875
CHLORIDE	160	175	1570*	136	157.0000	16.0624
FLUORIDE	1.40	1.4	2.0	0.2	1.2500	0.6538
SULPHATE	470	610	7100*	970	683.3333	210.6076
NITRATE-N	<0.2	<0.1	<1	0.1	0.0250	0.0433
AMMONIA-N	NA	NA	NA	NA	-	-
TOTAL KJELDAHL NITROGEN	NA	1.05	NA	NA	1.0500	0.0000
TOTAL PHOSPHOROUS	NA	2.3	NA	NA	2.3000	0.0000
DOC	4.0	NA	NA	4.8	4.4000	0.4000
PHENOLS	0.003	0.004	0.006	0.004	0.0043	0.0011
PCB (µg/L)	NA	NA	NA	NA	-	-
OIL AND GREASE	3	NA	NA	NA	3.0000	0.0000
ZINC	0.04	NA	0.01	0.01	0.0200	0.0141
CADMIUM	0.0012	NA	<0.005	<0.005	0.0004	0.0006
MANGANESE	1.24	NA	2.2	2.8	2.0800	0.6425
COBALT	0.02	NA	<0.01	0.01	0.0100	0.0082
COPPER	0.005	NA	<0.005	0.01	0.0050	0.0041
IRON	43	NA	39	63	48.3333	10.4987
LEAD	<0.05	NA	<0.05	<0.05	0.0000	0.0000
CHROMIUM	0.02	NA	<0.01	0.01	0.0100	0.0082
NICKEL	0.01	NA	<0.01	<0.01	0.0033	0.0047
BERYLLIUM	NA	NA	<0.01	<0.01	0.0000	0.0000
MOLYBDENUM	NA	NA	0.06	0.1	0.0800	0.0200
CALCIUM	NA	189	240	240	223.0000	24.0416
VANADIUM	NA	NA	0.02	0.01	0.0150	0.0050
ALUMINUM	NA	NA	0.22	0.32	0.2700	0.0500
MAGNESIUM	NA	25	28	35	29.3333	4.1899
BARIUM	NA	NA	0.15	0.13	0.1400	0.0100
POTASSIUM	NA	10.4	12.8	12.5	11.9000	1.0677
STRONTIUM	NA	NA	3.6	4.1	3.8500	0.2500
SODIUM	NA	73	195	180	149.3333	54.3221
ARSENIC (µg/L)	NA	NA	NA	NA	-	-
SELENIUM (µg/L)	NA	NA	NA	NA	-	-
MERCURY (µg/L)	NA	NA	NA	NA	-	-
CATION EQUIVALENCE	1.54	14.93	24.51	25.30		
ANION EQUIVALENCE	14.30	18.64	192.95	24.62		
CHARGE BALANCE ERROR	-80.56	-11.04	-77.46	1.35		
BTX (µg/L)						
BENZENE	NA	15	NA	NA	15.0000	0.0000
TOLUENE	NA	17	NA	NA	17.0000	0.0000
XYLENE	NA	<2	NA	NA	0.0000	0.0000
TOTAL BTX	-	32	-	-	32.0000	0.0000

Appendix 6: Groundwater

PIEZOMETER	D5-1	D5-1	D5-1	D5-1	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE	NA	<0.1	0.2	NA	0.1000	0.1000
ACENAPHTHYLENE	NA	<0.1	<0.1	NA	0.0000	0.0000
ACENAPHTHENE	NA	<0.1	<0.1	NA	0.0000	0.0000
FLUORENE	NA	<0.1	<0.1	NA	0.0000	0.0000
PHENANTHRENE	NA	<0.1	<0.1	NA	0.0000	0.0000
ANTHRACENE	NA	<0.1	<0.1	NA	0.0000	0.0000
FLUORANTHENE	NA	<0.1	<0.1	NA	0.0000	0.0000
PYRENE	NA	<0.1	<0.1	NA	0.0000	0.0000
BENZO(a)ANTHRACENE	NA	<0.1	<0.1	NA	0.0000	0.0000
CHRYSENE	NA	<0.1	<0.1	NA	0.0000	0.0000
BENZO(b)FLUORANTHENE	NA	<0.2	<0.2	NA	0.0000	0.0000
BENZO(k)FLUORANTHENE	NA	<0.1	<0.1	NA	0.0000	0.0000
BENZO(a)PYRENE	NA	<0.1	<0.1	NA	0.0000	0.0000
PERYLENE	NA	<0.1	<0.1	NA	0.0000	0.0000
INDENO(1,2,3-C,D)PYRENE	NA	<0.1	<0.1	NA	0.0000	0.0000
DIBENZO(a,h)ANTHRACENE	NA	<0.5	<0.5	NA	0.0000	0.0000
BENZO(g,h,i)PERYLENE	NA	<0.5	<0.5	NA	0.0000	0.0000
TOTAL PAHs	-	0	0.2	-	0.1000	0.1000

All Units are mg/L unless otherwise specified.

NA Not Analyzed

* Anomolous Values assumed to be laboratory errors. Values are not included in calculation of statistics.

Appendix 6: Groundwater

PIEZOMETER	DS-2	DS-2	DS-2	DS-2	Average	Standard Deviation
SAMPLE DATE	88/08/09	88/11/19	89/03/10	89/05/31		
BAS REF NO.	8808054-06	8811095-11	890378-2	8906045-8		
SAMPLING LEVEL	1	2+	2+	2		
pH	9.20	8.46	7.27	6.99	7.9800	0.8948
SPECIFIC CONDUCTANCE (µS/cm)	3260	5910	7650	7030	5962.5000	1680.2883
TEMPERATURE (°C)	11	8	6	10	8.7500	1.9203
DISSOLVED OXYGEN	7.4	NA	0	4.2	3.8667	3.0302
DIC	NA	NA	NA	NA	-	-
ALKALINITY	NA	113	177	115	135.0000	29.7097
SULPHIDE	NA	NA	NA	NA	-	-
TOTAL CYANIDE	NA	0.045	0.35	0.04/0.04	0.1450	0.1450
BROMIDE	<2	<2	<5/<5	<0.5	0.0000	0.0000
CHLORIDE	36	50	51/46	28	40.6250	9.0924
FLUORIDE	2.5	1.5	1.0/2.0	3.2	2.1750	0.7189
SULPHATE	2300	3200	3300/3300	3500	3075.0000	460.2988
NITRATE-N	<1	<0.5	1/<1	<0.1	0.1250	0.2165
AMMONIA-N	NA	NA	NA	NA	-	-
TOTAL KJELDAHL NITROGEN	NA	28	NA	NA	28.0000	0.0000
TOTAL PHOSPHOROUS	NA	1.37	NA	NA	1.3700	0.0000
DOC	26	NA	NA	28	27.0000	1.0000
PHENOLS	0.021	0.008	0.005	0.003	0.0093	0.0070
PCB (µg/L)	NA	NA	NA	NA	-	-
OIL AND GREASE	5	NA	NA	NA	5.0000	0.0000
ZINC	0.02	NA	0.02	0.03	0.0233	0.0047
CADMIUM	0.0002	NA	<0.005	<0.005	0.0001	0.0001
MANGANESE	0.20	NA	5.2	3	2.8000	2.0461
COBALT	0.03	NA	0.03	0.03	0.0300	0.0000
COPPER	0.005	NA	0.01	0.015	0.0100	0.0041
IRON	0.04	NA	132	28	53.3467	56.7756
LEAD	<0.05	NA	<0.05	<0.05	0.0000	0.0000
CHROMIUM	0.04	NA	0.03	0.04	0.0367	0.0047
NICKEL	0.02	NA	0.010	0.02	0.0167	0.0047
BERYLLIUM	NA	NA	<0.01	<0.01	0.0000	0.0000
MOLYBDENUM	NA	NA	0.08	0.07	0.0750	0.0050
CALCIUM	NA	210	760	560	510.0000	227.3030
VANADIUM	NA	NA	0.04	<0.01	0.0200	0.0200
ALUMINUM	NA	NA	0.56	0.7	0.6300	0.0700
MAGNESIUM	NA	31	65	66	54.0000	16.2686
BARIUM	NA	NA	0.11	0.09	0.1000	0.0100
POTASSIUM	NA	820	680	780	760.0000	58.8784
STRONTIUM	NA	NA	3.3	2.8	3.0500	0.2500
SODIUM	NA	240	280	260	260.0000	16.3299
ARSENIC (µg/L)	NA	NA	NA	NA	-	-
SELENIUM (µg/L)	NA	NA	NA	NA	-	-
MERCURY (µg/L)	NA	NA	NA	NA	-	-
CATION EQUIVALENCE	0.00	44.44	77.63	65.71		
ANION EQUIVALENCE	48.90	69.16	71.84	74.81		
CHARGE BALANCE ERROR	-99.99	-21.76	3.87	-6.47		
BTX (µg/L)						
BENZENE	NA	3	NA	NA	3.0000	0.0000
TOLUENE	NA	9	NA	NA	9.0000	0.0000
XYLENE	NA	<2	NA	NA	0.0000	0.0000
TOTAL BTX	-	12	-	-	12.0000	0.0000

Appendix 6: Groundwater

PIEZOMETER	DS-2	DS-2	DS-2	DS-2	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE	NA	2.3	0.6	NA	1.4500	0.8500
ACENAPHTHYLENE	NA	<0.1	<0.1	NA	0.0000	0.0000
ACENAPHTHENE	NA	2.1	0.7	NA	1.4000	0.7000
FLUORENE	NA	1.3	0.4	NA	0.8500	0.4500
PHENANTHRENE	NA	1.8	0.7	NA	1.2500	0.5500
ANTHRACENE	NA	0.3	0.1	NA	0.2000	0.1000
FLUORANTHENE	NA	0.3	0.1	NA	0.2000	0.1000
PYRENE	NA	0.2	<0.1	NA	0.1000	0.1000
BENZO(a)ANTHRACENE	NA	<0.1	<0.1	NA	0.0000	0.0000
CHRYSENE	NA	<0.1	<0.1	NA	0.0000	0.0000
BENZO(b)FLUORANTHENE	NA	<0.2	<0.2	NA	0.0000	0.0000
BENZO(k)FLUORANTHENE	NA	<0.1	<0.1	NA	0.0000	0.0000
BENZO(a)PYRENE	NA	<0.1	<0.1	NA	0.0000	0.0000
PERYLENE	NA	<0.1	<0.1	NA	0.0000	0.0000
INDENO(1,2,3-C,D)PYRENE	NA	<0.1	<0.1	NA	0.0000	0.0000
DIBENZO(a,h)ANTHRACENE	NA	<0.5	<0.5	NA	0.0000	0.0000
BENZO(g,h,i)PERYLENE	NA	<0.5	<0.5	NA	0.0000	0.0000
TOTAL PAHs	-	8.3	2.6	-	5.4500	2.8500

* All Units are mg/L unless otherwise specified.
NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	D6	D6	D6	D6	Average	Standard Deviation
SAMPLE DATE	88/08/09	88/11/17	89/03/10	89/05/30		
BAS REF NO.	8808054-07	8811092-3	890378-5	8906008-9		
SAMPLING LEVEL	1	1	2+	2+		
pH	7.27	7.23	7.15	7.13	7.1950	0.0572
SPECIFIC CONDUCTANCE (µS/cm)	2530	3030	3170	3000	2932.5000	241.0783
TEMPERATURE (°C)	13	8	7	11	9.7500	2.3848
DISSOLVED OXYGEN	9	NA	0.5	1.2	3.5667	3.8526
DIC	NA	NA	NA	NA	-	-
ALKALINITY	NA	760	640/630	640	678.3333	57.7831
SULPHIDE	NA	NA	NA	NA	-	-
TOTAL CYANIDE	NA	NA	0.11	0.102	0.1060	0.0040
BROMIDE	<2	<1	<1	<1	0.0000	0.0000
CHLORIDE	180	180	150	134	161.0000	19.8242
FLUORIDE	1.0	2.8	1.40	0.6	1.4500	0.8292
SULPHATE	450	460	103	650	415.7500	197.3682
NITRATE-N	<0.5	<0.2	<0.2	<0.2	0.0000	0.0000
AMMONIA-N	NA	NA	NA	NA	-	-
TOTAL KJELDAHL NITROGEN	NA	NA	2.5	NA	2.5000	0.0000
TOTAL PHOSPHOROUS	NA	NA	0.011	NA	0.0110	0.0000
DOC	24	32	NA	23	26.3333	4.0277
PHENOLS	<0.001	0.008	0.002	<0.001	0.0025	0.0033
PCB (µg/L)	NA	NA	NA	NA	-	-
OIL AND GREASE	7	NA	NA	NA	7.0000	0.0000
ZINC	0.04	NA	0.02	0.02/0.02	0.0267	0.0094
CADMIUM	0.0010	NA	<0.005	<0.005	0.0003	0.0005
MANGANESE	1.64	NA	1.99	2.2/2.1	1.9267	0.2130
COBALT	0.02	NA	<0.01	<0.01	0.0067	0.0094
COPPER	0.010	NA	<0.005	0.005	0.0050	0.0041
IRON	6.1	NA	35	32	24.3667	12.9744
LEAD	<0.05	NA	<0.05	<0.05	0.0000	0.0000
CHROMIUM	0.02	NA	<0.01	0.03/0.02	0.0150	0.0108
NICKEL	0.02	NA	<0.01	0.02/0.02	0.0133	0.0094
BERYLLIUM	NA	NA	<0.01	<0.01	0.0000	0.0000
MOLYBDENUM	NA	NA	0.02	<0.02	0.0100	0.0100
CALCIUM	NA	280	360	330	323.3333	32.9983
VANADIUM	NA	NA	0.05	0.04	0.0450	0.0050
ALUMINUM	NA	NA	0.32	0.3	0.3100	0.0100
MAGNESIUM	NA	100	102	117	106.3333	7.5865
BARIUM	NA	NA	0.08	0.07	0.0750	0.0050
POTASSIUM	NA	21	24	23	22.6667	1.2472
STRONTIUM	NA	NA	0.79	0.72	0.7550	0.0350
SODIUM	NA	84	168	102	118.0000	36.1109
ARSENIC (µg/L)	NA	NA	NA	NA	-	-
SELENIUM (µg/L)	NA	NA	NA	NA	-	-
MERCURY (µg/L)	NA	NA	NA	NA	-	-
CATION EQUIVALENCE	0.22	26.39	35.57	32.30		
ANION EQUIVALENCE	14.45	22.25	12.72	23.71		
CHARGE BALANCE ERROR	-97.02	8.52	47.31	15.34		
BTX (µg/L)						
BENZENE	NA	NA	62	NA	62.0000	0.0000
TOLUENE	NA	NA	<30	NA	0.0000	0.0000
XYLENE	NA	NA	<40	NA	0.0000	0.0000
TOTAL BTX	-	-	62	-	62.0000	0.0000

Appendix 6: Groundwater

PIEZOMETER	D6	D6	D6	D6	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE	NA	NA	<0.1	<0.5	0.0000	0.0000
ACENAPHTHYLENE	NA	NA	<0.1	<0.5	0.0000	0.0000
ACENAPHTHENE	NA	NA	<0.1	<0.5	0.0000	0.0000
FLUORENE	NA	NA	<0.1	<0.5	0.0000	0.0000
PHENANTHRENE	NA	NA	<0.1	<0.5	0.0000	0.0000
ANTHRACENE	NA	NA	<0.1	<0.5	0.0000	0.0000
FLUORANTHENE	NA	NA	<0.1	<0.5	0.0000	0.0000
PYRENE	NA	NA	<0.1	<0.2	0.0000	0.0000
BENZO(a)ANTHRACENE	NA	NA	<0.1	<0.2	0.0000	0.0000
CHRYSENE	NA	NA	<0.1	<0.2	0.0000	0.0000
BENZO(b)FLUORANTHENE	NA	NA	<0.2	<0.2	0.0000	0.0000
BENZO(k)FLUORANTHENE	NA	NA	<0.1	<0.2	0.0000	0.0000
BENZO(a)PYRENE	NA	NA	<0.1	<0.5	0.0000	0.0000
PERYLENE	NA	NA	<0.1	<0.5	0.0000	0.0000
INDENO(1,2,3-C,D)PYRENE	NA	NA	<0.1	<0.5	0.0000	0.0000
DIBENZO(a,h)ANTHRACENE	NA	NA	<0.5	<0.5	0.0000	0.0000
BENZO(g,h,i)PERYLENE	NA	NA	<0.5	<0.5	0.0000	0.0000
TOTAL PAHs	-	-	0	0	0.0000	0.0000

* All Units are mg/L unless otherwise specified.
NA Not Analyzed

Appendix 6: Groundwater

PIEZOMETER	TRIP BLANK	TRIP BLANK	TRIP BLANK	TRIP BLANK	Average	Standard Deviation
SAMPLE DATE	88/08/10	88/11/17	89/03/10	89/05/30		
BAS REF NO.	8808065	8811120-13	890378-3	8906036-3		
SAMPLING LEVEL		8811095-7				
pH	NA	NA	NA	NA	-	-
SPECIFIC CONDUCTANCE (µS/cm)	NA	NA	NA	NA	-	-
TEMPERATURE (°C)	NA	NA	NA	NA	-	-
DISSOLVED OXYGEN (ppm)	NA	NA	NA	NA	-	-
DIC	1	NA	NA	NA	1.0000	0.0000
ALKALINITY	2	2	NA	NA	2.0000	0.0000
SULPHIDE	<0.05	NA	NA	NA	0.0000	0.0000
TOTAL CYANIDE	<0.002	NA	<0.005	NA	0.0000	0.0000
BROMIDE	<0.05	<0.05	NA	NA	0.0000	0.0000
CHLORIDE	<0.02	<0.01	NA	NA	0.0000	0.0000
FLUORIDE	<0.01	<0.01	NA	NA	0.0000	0.0000
SULPHATE	<0.1	<0.2	NA	NA	0.0000	0.0000
NITRATE-N	<0.01	<0.01	NA	NA	0.0000	0.0000
AMMONIA-N	<0.01	NA	NA	NA	0.0000	0.0000
TOTAL KJELDAHL NITROGEN	<0.05	NA	NA	NA	0.0000	0.0000
TOTAL PHOSPHOROUS	<0.001	NA	NA	NA	0.0000	0.0000
DOC	<0.5	NA	NA	NA	0.0000	0.0000
PHENOLS	0.003	<0.001	0.001	NA	0.0020	0.0010
PCB (µg/L)	<0.1	NA	<0.02	NA	0.0000	0.0000
OIL AND GREASE	2	NA	NA	NA	2.0000	0.0000
ZINC	<0.01	NA	NA	NA	0.0000	0.0000
CADMIUM	0.0004	NA	NA	NA	0.0004	0.0000
MANGANESE	<0.01	NA	NA	NA	0.0000	0.0000
COBALT	<0.01	NA	NA	NA	0.0000	0.0000
COPPER	<0.005	NA	NA	NA	0.0000	0.0000
IRON	0.02	NA	NA	NA	0.0200	0.0000
LEAD	<0.05	NA	NA	NA	0.0000	0.0000
CHROMIUM	<0.01	NA	NA	NA	0.0000	0.0000
NICKEL	<0.01	NA	NA	NA	0.0000	0.0000
BERYLLIUM	<0.01	NA	NA	NA	0.0000	0.0000
MOLYBDENUM	<0.02	NA	NA	NA	0.0000	0.0000
CALCIUM	<0.05	0.5/0.5	NA	NA	0.2500	0.2500
VANADIUM	<0.01	NA	NA	NA	0.0000	0.0000
ALUMINUM	<0.02	NA	NA	NA	0.0000	0.0000
MAGNESIUM	<0.05	0.1	NA	NA	0.0500	0.0500
BARIUM	<0.01	NA	NA	NA	0.0000	0.0000
POTASSIUM	<0.05	0.05	NA	NA	0.0250	0.0250
STRONTIUM	<0.01	NA	NA	NA	0.0000	0.0000
SODIUM	<0.5	<0.5	NA	NA	0.0000	0.0000
ARSENIC (µg/L)	<1/<2	NA	NA	NA	0.0000	0.0000
SELENIUM (µg/L)	<1/<2	NA	NA	NA	0.0000	0.0000
MERCURY (µg/L)	<0.05	NA	NA	NA	0.0000	0.0000
CATION EQUIVALENCE	0.00	0.03	0.00	0.00		
ANION EQUIVALENCE	0.02	0.02	0.00	0.00		
CHARGE BALANCE ERROR	-93.08	26.59	-	-		
BTX (µg/L)						
BENZENE	NA	<2	NA	<2	0.0000	0.0000
TOLUENE	NA	<1	NA	<1	0.0000	0.0000
XYLENE	NA	<2	NA	<2	0.0000	0.0000
TOTAL BTX	-	0	-	0	0.0000	0.0000

Appendix 6: Groundwater

PIEZOMETER	TRIP BLANK	TRIP BLANK	TRIP BLANK	TRIP BLANK	Average	Standard Deviation
PAHs (µg/L)						
NAPHTHALENE	0.05	<0.1	<0.1	<0.1	0.0125	0.0217
ACENAPHTHYLENE	<0.01	<0.1	<0.1	<0.1	0.0000	0.0000
ACENAPHTHENE	<0.01	<0.1	<0.1	<0.1	0.0000	0.0000
FLUORENE	<0.01	<0.1	<0.1	<0.1	0.0000	0.0000
PHENANTHRENE	0.03	<0.1	<0.1	<0.1	0.0075	0.0130
ANTHRACENE	<0.01	<0.1	<0.1	<0.1	0.0000	0.0000
FLUORANTHENE	<0.01	<0.1	<0.1	<0.1	0.0000	0.0000
PYRENE	<0.01	<0.1	<0.1	<0.2	0.0000	0.0000
BENZO(a)ANTHRACENE	<0.02	<0.1	<0.1	<0.2	0.0000	0.0000
CHRYSENE	<0.02	<0.1	<0.1	<0.2	0.0000	0.0000
BENZO(b)FLUORANTHENE	<0.05	<0.2	<0.2	<0.2	0.0000	0.0000
BENZO(k)FLUORANTHENE	<0.05	<0.1	<0.1	<0.2	0.0000	0.0000
BENZO(a)PYRENE	<0.05	<0.1	<0.1	<0.5	0.0000	0.0000
PERYLENE	<0.05	<0.1	<0.1	<0.5	0.0000	0.0000
INDENO(1,2,3-C,D)PYRENE	<0.1	<0.1	<0.1	<0.5	0.0000	0.0000
DIBENZO(a,h)ANTHRACENE	<0.2	<0.5	<0.5	<0.5	0.0000	0.0000
BENZO(g,h,i)PERYLENE	<0.1	<0.5	<0.5	<0.5	0.0000	0.0000
TOTAL PAHs	0.08	0	0	0	0.0800	0.0000

* All Units are mg/L unless otherwise specified.
NA Not Analyzed

SEEPAGE WATER AND SEDIMENTS

Appendix 6: St. Marys River Seepage Water

MINI PIEZOMETER	SP-A1	SP-A2	SP-A2	SP-A2	SP-A3
Sample Date	88/09/06	88/09/06	88/11/21	89/06/02	88/09/06
BAS Reference Number	8809030-06	8809030-08	8811121-0	8906022-1	8809030-07
Sampling Level	2	3		2+	2
pH	11.92	9.03	9.68	11.79	8.24
Specific Conductance (uS/cm)	3920	1530	1460	4850	1100
Temperature (C)	NA	NA	3	15	20
Dissolved Oxygen	NA	NA	NA	NA	3.8
Dissolved Inorganic Carbon	10	9	34	NA	27
Alkalinity (as CaCO3)	480	35	NA	490	101
Sulphide	<0.05	0.02	NA	NA	<0.05
Total Cyanide	NA	<0.002	<0.002	0.007	-
Bromide	<3	<1	<0.5	<1	<1
Chloride	74	85	81	116	90
Fluoride	0.50	0.40	0.6	1.2	0.30
Sulphate	490	480	530	610	230
Nitrate-N	6.5	<0.1	NA	<0.2	0.10
Ammonia-N	NA	4.2	NA	NA	NA
Total Kjeldahl Nitrogen	2.9/3.4	5.0	5	NA	6.3
Total Phosphorous	NA	0.015	0.017	NA	NA
Dissolved Organic Carbon	5.5	6.0	NA	7	5
Phenol	0.027	0.011	NA	0.018	0.005
Oil and Grease	NA	NA	NA	NA	NA
Zinc	<0.01	<0.01	NA	<0.01	<0.01
Cadmium	0.0010	0.0006	NA	<0.005	0.0008
Manganese	<0.01	0.11	NA	0.01	0.30
Cobalt	0.01	<0.01	NA	<0.01	<0.01
Copper	<0.005	<0.005	NA	<0.005	<0.005
Iron	0.04	0.02	NA	0.1	0.10
Lead	<0.05	<0.05	NA	<0.05	<0.05
Chromium	0.01	<0.01	NA	0.02	<0.01
Nickel	<0.01	<0.01	NA	0.01	<0.01
Beryllium	<0.01	<0.01	NA	<0.01	<0.01
Molybdenum	0.06	0.04	NA	0.04	0.02
Calcium	230	121	140	270	87
Vanadium	0.04	0.01	NA	0.03	<0.01
Aluminum	0.48	0.22	NA	0.34	0.16
Magnesium	0.25	4.3	4.2	0.05	6.0
Barium	0.08	0.16	NA	0.07	0.19
Potassium	240	45	48	230	18.3
Strontium	1.19	0.73	NA	1.26	0.47
Sodium	103	106	109	129	80
Selenium (ug/L)	NA	<1	NA	NA	NA
Arsenic (ug/L)	NA	11	NA	NA	NA
Mercury (ug/L)	NA	<0.05	NA	NA	NA

Appendix 6: St. Marys River Seepage Water

MINI PIEZOMETER	SP-A1	SP-A2	SP-A2	SP-A2	SP-A3
Sample Date	88/09/06	88/09/06	88/11/21	89/06/02	88/09/06
BAS Reference Number	8809030-06	8809030-08	8811121-0	8906022-1	8809030-07
Sampling Level	2	3		2+	2
BTX (ug/L)					
Benzene	NA	NA	<2	<2	NA
Toluene	NA	NA	<1	<1	NA
Xylenes	NA	NA	<2	<2	NA
Total BTX	NA	NA	0	0	NA
PAHs (ug/L)					
Naphthalene	8.7	2.6	6.3	8.4	0.05
Acenaphthylene	0.32	0.05	0.1	0.2	0.07
Acenaphthene	1.6	0.78	1.6	2	0.05
Fluorene	0.96	0.48	0.7	1	0.01
Phenanthrene	2.4	0.40	0.7	2.5	0.04
Anthracene	0.22	<0.01	<0.1	0.2	0.01
Fluoranthene	1.4	<0.01	<0.1	0.8	0.07
Pyrene	0.96	<0.01	<0.1	0.5	0.06
Benzo(a)anthracene	0.05	<0.02	<0.1	<0.2	<0.02
Chrysene	0.09	<0.02	<0.1	<0.2	<0.02
Benzo(b)fluoranthene	<0.05	<0.05	<0.2	<0.2	<0.05
Benzo(k)fluoranthene	<0.05	<0.05	<0.1	<0.2	<0.05
Benzo(a)pyrene	<0.1	<0.1	<0.1	<0.5	<0.1
Perylene	<0.1	<0.1	<0.1	<0.5	<0.1
Indeno(1,2,3-c,d)pyrene	<0.1	<0.1	<0.1	<0.5	<0.1
Dibenzo(a,h)anthracene	<0.2	<0.2	<0.5	<0.5	<0.2
Benzo(g,h,i)perylene	<0.1	<0.1	<0.5	<0.5	<0.1
Total PAHs	16.7	4.31	0	0	0.36
ND None Detected					
NA Not Analyzed					
Phenol Species Detected	NA	ND	NA	NA	NA
Phenol (ug/L)					
VOCs Detected	ND	ND	NA	NA	ND
Trichlorofluoromethane (ug/L)					

* All Units are mg/L unless otherwise specified.
NA - Not Analysed

Appendix 6: St. Marys River Seepage Water

MINI PIEZOMETER	SP-B1	SP-B1	SP-P30	SP-P46
Sample Date	88/09/06	88/11/21	88/08/31	88/08/31
BAS Reference Number	8809045-01	8811121-0	8809030-02	8809030-01
Sampling Level	1		1	1
pH	6.88	7.05	7.13	8.04
Specific Conductance (uS/cm)	460	470	2420	520
Temperature (C)	17	5	19	19
Dissolved Oxygen	3	NA	3.4	8.4
Dissolved Inorganic Carbon	NA	171	NA	NA
Alkalinity (as CaCO3)	NA	NA	NA	NA
Sulphide	NA	NA	NA	NA
Total Cyanide	NA	<0.002	NA	NA
Bromide	<0.1	<1	<2	<0.1
Chloride	1.86	470/470	550	56
Fluoride	0.06	<0.5	0.25	0.04
Sulphate	0.10	310/310	270	33
Nitrate-N	<0.01	NA	<0.2	0.26
Ammonia-N	NA	NA	NA	NA
Total Kjeldahl Nitrogen	NA	0.26	NA	NA
Total Phosphorous	NA	0.006	NA	NA
Dissolved Organic Carbon	1.5	NA	23	3.5
Phenol	<0.001	NA	<0.001	0.001
Oil and Grease	4	NA	3	2
Zinc	0.01	NA	0.01	<0.01
Cadmium	0.0008	NA	0.0006	0.0002
Manganese	0.36	NA	3.0	0.45
Cobalt	<0.01	NA	0.02	<0.01
Copper	<0.005	NA	0.020	<0.005
Iron	9.1	NA	0.02	<0.02
Lead	<0.05	NA	<0.05	<0.05
Chromium	<0.01	NA	0.02	<0.01
Nickel	<0.01	NA	0.02	<0.01
Beryllium	NA	NA	NA	NA
Molybdenum	NA	NA	NA	NA
Calcium	NA	300	NA	NA
Vanadium	NA	NA	NA	NA
Aluminum	NA	NA	NA	NA
Magnesium	NA	51	NA	NA
Barium	NA	NA	NA	NA
Potassium	NA	6.1	NA	NA
Strontium	NA	NA	NA	NA
Sodium	NA	58	NA	NA
Selenium (ug/L)	NA	NA	NA	NA
Arsenic (ug/L)	NA	NA	NA	NA
Mercury (ug/L)	NA	NA	NA	NA

Appendix 6: St. Marys River Seepage Water

MINI PIEZOMETER	SP-B1	SP-B1	SP-P30	SP-P46
Sample Date	88/09/06	88/11/21	88/08/31	88/08/31
BAS Reference Number	8809045-01	8811121-0	8809030-02	8809030-01
Sampling Level	1		1	1
BTX (ug/L)				
Benzene	NA	<2	NA	NA
Toluene	NA	<1	NA	NA
Xylenes	NA	<2	NA	NA
Total BTX	NA	0	NA	NA
PAHs (ug/L)				
Naphthalene	0.14	<0.1	NA	NA
Acenaphthylene	0.03	<0.1	NA	NA
Acenaphthene	0.06	<0.1	NA	NA
Fluorene	0.03	<0.1	NA	NA
Phenanthrene	0.08	<0.1	NA	NA
Anthracene	0.01	<0.1	NA	NA
Fluoranthene	0.01	<0.1	NA	NA
Pyrene	0.01	<0.1	NA	NA
Benzo(a)anthracene	<0.02	<0.1	NA	NA
Chrysene	<0.02	<0.1	NA	NA
Benzo(b)fluoranthene	<0.05	<0.2	NA	NA
Benzo(k)fluoranthene	<0.05	<0.1	NA	NA
Benzo(a)pyrene	<0.1	<0.1	NA	NA
Perylene	<0.1	<0.1	NA	NA
Indeno(1,2,3-c,d)pyrene	<0.1	<0.1	NA	NA
Dibenzo(a,h)anthracene	<0.2	<0.5	NA	NA
Benzo(g,h,i)perylene	0.1	<0.5	NA	NA
Total PAHs	0.47	0	0	0
ND None Detected				
NA Not Analyzed				
Phenol Species Detected	1	NA	NA	NA
Phenol (ug/L)				
VOCs Detected	2.1	NA	NA	NA
Trichlorofluoromethane (ug/L)				

* All Units are mg/L unless otherwise specified.
NA - Not Analysed

Appendix 6: St. Marys River Seepage Water

MINI PIEZOMETER	SP-P47	SP-P47	SP-P48	SP-P49
Sample Date	88/09/02	88/11/21	88/09/02	88/08/31
BAS Reference Number	8809029-01	8811121-0	8809029-02	8809030-03
Sampling Level	3		1	1
pH	7.03	7.02	7.92	8.04
Specific Conductance (uS/cm)	2320	2690	890	860
Temperature (C)	18	4	18	20
Dissolved Oxygen	2.1	NA	2.4	4.5
Dissolved Inorganic Carbon	48	210/210	NA	NA
Alkalinity (as CaCO3)	169	NA	NA	NA
Sulphide	<0.05	NA	NA	NA
Total Cyanide	<0.002	<0.002	NA	NA
Bromide	<1	<0.05	<0.5	0.7/0.7
Chloride	420	1.67	121	92/93
Fluoride	0.30	0.28	0.08/0.10	0.2/0.1
Sulphate	270	<0.1	154	122/126
Nitrate-N	0.40	NA	0.04	<0.1
Ammonia-N	0.01	NA	NA	NA
Total Kjeldahl Nitrogen	0.25	1.62	NA	NA
Total Phosphorous	0.005	0.112	NA	NA
Dissolved Organic Carbon	28	NA	17	14.5
Phenol	<0.001	NA	<0.001	<0.001
Oil and Grease	NA	NA	2	3
Zinc	0.02	NA	0.02	0.01
Cadmium	0.0008	NA	0.0010	0.0016
Manganese	0.08	NA	<0.01	0.01
Cobalt	0.02	NA	<0.01	<0.01
Copper	0.015	NA	0.005	0.010
Iron	0.02	NA	<0.02	<0.02
Lead	<0.05	NA	<0.05	<0.05
Chromium	0.02	NA	0.01	<0.01
Nickel	0.01	NA	<0.01	<0.01
Beryllium	<0.01	NA	NA	NA
Molybdenum	0.04	NA	NA	NA
Calcium	290	57	NA	NA
Vanadium	0.02	NA	NA	NA
Aluminum	0.36	NA	NA	NA
Magnesium	50	10.5	NA	NA
Barium	0.08	NA	NA	NA
Potassium	5.8	2.2	NA	NA
Strontium	1.16	NA	NA	NA
Sodium	54	10.5	NA	NA
Selenium (ug/L)	<1/<2	NA	NA	NA
Arsenic (ug/L)	<1/<2	NA	NA	NA
Mercury (ug/L)	<0.05	NA	NA	NA

Appendix 6: St. Marys River Seepage Water

MINI PIEZOMETER	SP-P47	SP-P47	SP-P48	SP-P49
Sample Date	88/09/02	88/11/21	88/09/02	88/08/31
BAS Reference Number	8809029-01	8811121-0	8809029-02	8809030-03
Sampling Level	3		1	1
BTX (ug/L)				
Benzene	NA	<2	NA	NA
Toluene	NA	<1	NA	NA
Xylenes	NA	<2	NA	NA
Total BTX	NA	0	NA	NA
PAHs (ug/L)				
Naphthalene	NA	<0.1	NA	NA
Acenaphthylene	NA	<0.1	NA	NA
Acenaphthene	NA	<0.1	NA	NA
Fluorene	NA	<0.1	NA	NA
Phenanthrene	NA	<0.1	NA	NA
Anthracene	NA	<0.1	NA	NA
Fluoranthene	NA	<0.1	NA	NA
Pyrene	NA	<0.1	NA	NA
Benzo(a)anthracene	NA	<0.1	NA	NA
Chrysene	NA	<0.1	NA	NA
Benzo(b)fluoranthene	NA	<0.2	NA	NA
Benzo(k)fluoranthene	NA	<0.1	NA	NA
Benzo(a)pyrene	NA	<0.1	NA	NA
Perylene	NA	<0.1	NA	NA
Indeno(1,2,3-c,d)pyrene	NA	<0.1	NA	NA
Dibenzo(a,h)anthracene	NA	<0.5	NA	NA
Benzo(g,h,i)perylene	NA	<0.5	NA	NA
Total PAHs	0	0	0	0
ND None Detected				
NA Not Analyzed				
Phenol Species Detected	NA	NA	NA	NA
Phenol (ug/L)				
VOCs Detected	NA	NA	NA	NA
Trichlorofluoromethane (ug/L)				

* All Units are mg/L unless otherwise specified.
NA - Not Analysed

Appendix 6: St. Marys River Seepage Water

MINI PIEZOMETER	SP-P50	SP-P51	SP-P52
Sample Date	88/09/02	88/08/31	88/08/31
BAS Reference Number	8809029-03	8809030-04	8809030-05
Sampling Level	1	1	1
pH	7.03	7.34	7.53
Specific Conductance (uS/cm)	2320	2370	2060
Temperature (C)	18	19	19
Dissolved Oxygen	2.6	3.6	3.8
Dissolved Inorganic Carbon	NA	NA	NA
Alkalinity (as CaCO3)	NA	NA	NA
Sulphide	NA	NA	NA
Total Cyanide	NA	NA	NA
Bromide	<2	<2	<2
Chloride	500	470	360
Fluoride	<0.2	0.50	0.50
Sulphate	270	260	300
Nitrate-N	<0.2	<0.2	0.25
Ammonia-N	NA	NA	NA
Total Kjeldahl Nitrogen	NA	NA	NA
Total Phosphorous	NA	NA	NA
Dissolved Organic Carbon	25	26	31
Phenol	<0.001	<0.001	<0.001
Oil and Grease	2	4	4
Zinc	0.20	0.02/0.01	0.03
Cadmium	0.0014	0.0010	0.0010
Manganese	5.4	0.04/0.04	0.01
Cobalt	0.02	0.02/0.02	0.02
Copper	0.025	0.020	0.045
Iron	0.02	0.02/0.02	0.02
Lead	<0.05	<0.05	<0.05
Chromium	0.02	0.02/0.02	0.02
Nickel	0.01	0.01/0.01	0.01
Beryllium	NA	NA	NA
Molybdenum	NA	NA	NA
Calcium	NA	NA	NA
Vanadium	NA	NA	NA
Aluminum	NA	NA	NA
Magnesium	NA	NA	NA
Barium	NA	NA	NA
Potassium	NA	NA	NA
Strontium	NA	NA	NA
Sodium	NA	NA	NA
Selenium (ug/L)	NA	NA	NA
Arsenic (ug/L)	NA	NA	NA
Mercury (ug/L)	NA	NA	NA

Appendix 6: St. Marys River Seepage Water

MINI PIEZOMETER	SP-P50	SP-P51	SP-P52
Sample Date	88/09/02	88/08/31	88/08/31
BAS Reference Number	8809029-03	8809030-04	8809030-05
Sampling Level	1	1	1
BTX (ug/L)			
Benzene	NA	NA	NA
Toluene	NA	NA	NA
Xylenes	NA	NA	NA
Total BTX	NA	NA	NA
PAHs (ug/L)			
Naphthalene	NA	NA	NA
Acenaphthylene	NA	NA	NA
Acenaphthene	NA	NA	NA
Fluorene	NA	NA	NA
Phenanthrene	NA	NA	NA
Anthracene	NA	NA	NA
Fluoranthene	NA	NA	NA
Pyrene	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA
Chrysene	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA
Perylene	NA	NA	NA
Indeno(1,2,3-c,d)pyrene	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA
Total PAHs	0	0	0
Phenol Species Detected	NA	NA	NA
Phenol (ug/L)			
VOCs Detected	NA	NA	NA
Trichlorofluoromethane (ug/L)			

ND None Detected
NA Not Analyzed

* All Units are mg/L unless otherwise specified.
NA - Not Analysed

Appendix 6: Creek Bed Seepage Water

MINI-PIEZOMETER	CBA1-1	CBA1-2	CBB1-1	CBB2-2	CBC1-2
LAB I.D.	MPA1-1	MPA1-2	MP81-1	Composite MP82-1	MPC1-2
SAMPLE DATE	89/06/02	89/06/02	89/06/02	89/06/02	89/06/02
BAS REF NO.	8906018-3	8906018-9	8906018-4	8906018-8	8906018-5
pH	6.57	NA	6.61	6.85	6.88
SPECIFIC CONDUCTANCE (uS/cm)	4050	NA	3750*	11980*	1490
TEMPERATURE (C)	15	NA	11	14	12
DISSOLVED OXYGEN	NA	NA	NA	NA	NA
DIC	NA	NA	NA	NA	NA
ALKALINITY	112	101/99	32	146	300
SULPHIDE	NA	NA	NA	NA	NA
TOTAL CYANIDE	0.071	NA	0.067	NA	<0.002
BROMIDE	<1	<1	<1	0.05	<0.5/<0.5
CHLORIDE	290	260	200	4.8	147/145
FLUORIDE	1.6	1.4	1.8	0.24	0.80/0.60
SULPHATE	1150	890	1360	37	87/82
NITRATE-N	<0.2	<0.2	<0.2	<0.01	<0.1/<0.1
AMMONIA-N	NA	NA	NA	NA	NA
TOTAL KJELDAHL NITROGEN	13.8	7.8	50	1.92	0.45
TOTAL PHOSPHOROUS	0.002	0.003	0.01	0.006	0.001
DOC	22	59	13.7	45/46	195
PHENOLS	0.012	0.006	0.017	0.004	<0.001
PCB	NA	NA	NA	NA	NA
OIL AND GREASE	NA	NA	NA	NA	NA
ZINC	0.03	NA	0.04	NA	0.02
CADMIUM	<0.005	NA	<0.005	NA	<0.005
MANGANESE	5.2	NA	4.1	NA	1.1
COBALT	0.04	NA	0.03	NA	<0.01
COPPER	0.01	NA	0.005	NA	<0.005
IRON	88	NA	260	NA	12.7
LEAD	<0.05	NA	<0.05	NA	<0.05
CHROMIUM	0.03	NA	0.03	NA	<0.01
NICKEL	0.02	NA	0.01	NA	<0.01
BERYLLIUM	<0.01	NA	<0.01	NA	<0.01
MOLYBDENUM	0.02	NA	0.04	NA	<0.02
CALCIUM	370	NA	270	NA	153
VANADIUM	0.03	NA	0.04	NA	0.02
ALUMINUM	0.4	NA	0.32	NA	0.16
MAGNESIUM	76	NA	34	NA	34
BARIUM	0.05	NA	0.12	NA	0.27
POTASSIUM	54	NA	126	NA	6.9
STRONTIUM	1.63	NA	2.1	NA	0.58
SODIUM	128	NA	64	NA	28
ARSENIC (ug/L)	NA	NA	NA	NA	NA
SELENIUM (ug/L)	NA	NA	NA	NA	NA
MERCURY (ug/L)	NA	NA	NA	NA	NA

Appendix 6: Creek Bed Seepage Water

MINI-PIEZOMETER	CBA1-1	CBA1-2	CBB1-1	CBB2-2	CBC1-2
BTX (ug/L)					
BENZENE	<2	NA	2/2	NA	<2
TOLUENE	<1	NA	<1/<1	NA	<1
XYLENE	<2	NA	<2/<2	NA	<2
TOTAL BTX	0	NA	2/2	NA	0
PAHs (ug/L)					
NAPHTHALENE	1.8	NA	0.2	NA	25
ACENAPHTHYLENE	1.7	NA	<0.1	NA	0.7
ACENAPHTHENE	2.9	NA	<0.1	NA	0.8
FLUORENE	0.1	NA	<0.1	NA	<0.1
PHENANTHRENE	<0.1	NA	<0.1	NA	<0.1
ANTHRACENE	<0.1	NA	<0.1	NA	<0.1
FLUORANTHENE	<0.1	NA	<0.1	NA	<0.1
PYRENE	<0.2	NA	<0.2	NA	<0.2
BENZO(a)ANTHRACENE	<0.2	NA	<0.2	NA	<0.2
CHRYSENE	<0.2	NA	<0.2	NA	<0.2
BENZO(b)FLUORANTHENE	<0.2	NA	<0.2	NA	<0.2
BENZO(k)FLUORANTHENE	<0.2	NA	<0.2	NA	<0.2
BENZO(a)PYRENE	<0.5	NA	<0.5	NA	<0.5
PERYLENE	<0.5	NA	<0.5	NA	<0.5
INDENO(1,2,3-C,D)PYRENE	<0.5	NA	<0.5	NA	<0.5
DIBENZO(a,h)ANTHRACENE	<0.5	NA	<0.5	NA	<0.5
BENZO(g,h,i)PERYLENE	<0.5	NA	<0.5	NA	<0.5
TOTAL PAHs	6.5	NA	0.2	NA	26.5

* Meter Malfunctioning
All Units are mg/L unless otherwise specified.
NA - Not Analyzed

Appendix 6: Creek Bed Seepage Water

MINI-PIEZOMETER	CBC1-3	CBC2-1	CBC2-2	CBC3-1	CBC3-2
LAB I.D.	MPC1-3	MPC2-E	MPC2-W	MPC3-E	MBC3-W
SAMPLE DATE	89/06/02	89/06/02	89/06/02	89/06/02	89/06/02
BAS REF NO.	8906018-6	8906018-13	8906018-12	8906018-10	8906018-11
pH	6.62	NA	NA	NA	NA
SPECIFIC CONDUCTANCE (uS/cm)	6220	NA	NA	NA	NA
TEMPERATURE (C)	15	NA	NA	NA	NA
DISSOLVED OXYGEN	NA	NA	NA	NA	NA
DIC	NA	NA	NA	NA	NA
ALKALINITY	230	250	135	65	129
SULPHIDE	NA	NA	NA	NA	NA
TOTAL CYANIDE	<0.002	NA	NA	NA	NA
BROMIDE	<1	0.5	<1	<1	<1
CHLORIDE	1190	390	600	920	820
FLUORIDE	1.5	1.7	<0.5	0.6	<0.5
SULPHATE	900	31	149	160	200/200
NITRATE-N	<0.2	<0.1	<0.2	<0.2	<0.2
AMMONIA-N	NA	NA	NA	NA	NA
TOTAL KJELDAHL NITROGEN	0.86/0.89	12.6/12.8	7.6	8.6	3.5
TOTAL PHOSPHOROUS	0.01	0.016	0.93	0.028	0.005
DOC	41	554	1050	147	163
PHENOLS	0.001	NA	NA	NA	NA
PCB	NA	NA	NA	NA	NA
OIL AND GREASE	NA	NA	NA	NA	NA
ZINC	0.04	NA	NA	NA	NA
CADMIUM	<0.005	NA	NA	NA	NA
MANGANESE	11	NA	NA	NA	NA
COBALT	0.06	NA	NA	NA	NA
COPPER	0.015	NA	NA	NA	NA
IRON	1.9	NA	NA	NA	NA
LEAD	<0.05	NA	NA	NA	NA
CHROMIUM	0.05	NA	NA	NA	NA
NICKEL	0.05	NA	NA	NA	NA
BERYLLIUM	<0.01	NA	NA	NA	NA
MOLYBDENUM	0.04	NA	NA	NA	NA
CALCIUM	790	NA	NA	NA	NA
VANADIUM	0.04	NA	NA	NA	NA
ALUMINUM	0.98	NA	NA	NA	NA
MAGNESIUM	123	NA	NA	NA	NA
BARIUM	0.11	NA	NA	NA	NA
POTASSIUM	13.9	NA	NA	NA	NA
STRONTIUM	2.9	NA	NA	NA	NA
SODIUM	44	NA	NA	NA	NA
ARSENIC (ug/L)	NA	NA	NA	NA	NA
SELENIUM (ug/L)	NA	NA	NA	NA	NA
MERCURY (ug/L)	NA	NA	NA	NA	NA

Appendix 6: Creek Bed Seepage Water

MINI-PIEZOMETER	CBC1-3	CBC2-1	CBC2-2	CBC3-1	CBC3-2
BTX (ug/L)					
BENZENE	13	NA	NA	NA	NA
TOLUENE	<1	NA	NA	NA	NA
XYLENE	<2	NA	NA	NA	NA
TOTAL BTX	13	NA	NA	NA	NA
PAHs (ug/L)					
NAPHTHALENE	<0.1	NA	NA	NA	NA
ACENAPHTHYLENE	<0.1	NA	NA	NA	NA
ACENAPHTHENE	<0.1	NA	NA	NA	NA
FLUORENE	<0.1	NA	NA	NA	NA
PHENANTHRENE	<0.1	NA	NA	NA	NA
ANTHRACENE	<0.1	NA	NA	NA	NA
FLUORANTHENE	<0.1	NA	NA	NA	NA
PYRENE	<0.2	NA	NA	NA	NA
BENZO(a)ANTHRACENE	<0.2	NA	NA	NA	NA
CHRYSENE	0.5	NA	NA	NA	NA
BENZO(b)FLUORANTHENE	<0.2	NA	NA	NA	NA
BENZO(k)FLUORANTHENE	<0.2	NA	NA	NA	NA
BENZO(a)PYRENE	<0.5	NA	NA	NA	NA
PERYLENE	<0.5	NA	NA	NA	NA
INDENO(1,2,3-C,D)PYRENE	<0.5	NA	NA	NA	NA
DIBENZO(a,h)ANTHRACENE	<0.5	NA	NA	NA	NA
BENZO(g,h,i)PERYLENE	<0.5	NA	NA	NA	NA
TOTAL PAHs	0.5	NA	NA	NA	NA

* Meter Malfunctioning
All Units are mg/L unless otherwise specified.
NA - Not Analyzed

SEDIMENT ANALYSES

Sample ID	A4 0-10	A4 20-30
Sample Date	07/88	07/88
Sampling Level	2	2
BAS Reference Number	8808085-06	8808085-07
pH	8.7	9.2
Specific Conductance (uS/cm)	370	297
Loss on Ignition (%)	0.49	0.81
Moisture Content (%)	13.8	15.1
Phenols	<0.5	<0.5
Oil & Grease	150	45
Total Phosphorous	400	340
Bromide	-	-
Chloride	-	-
Fluoride	-	-
Nitrate-N	-	-
Ammonia-N	7	7
Total Kjeldahl Nitrogen	260	44
Sulphate	-	-
Zinc	35	15
Cadmium	0.05	<0.05
Manganese	1560	450
Cobalt	5	4
Copper	11	7
Iron	15500	10800
Lead	10	4
Chromium	34	15
Nickel	8	5
Beryllium	<1	<1
Molybdenum	<2	<2
Calcium	26000	5000
Vanadium	35	28
Aluminum	12000	5100
Magnesium	4000	2200
Barium	33	20
Potassium	1030	870
Strontium	28	16
Sodium	530	330
PAHs		
Naphthalene	0.021	0.005
Acenaphthylene	0.010	0.003
Acenaphthene	0.017	0.005
Fluorene	0.012	0.007
Phenanthrene	0.172	0.047
Anthracene	0.032	0.009
Fluoranthene	0.45	0.084
Pyrene	0.38	0.079
Benzo(a)anthracene	0.24	0.044
Chrysene	0.31	0.063
Benzo(b)fluoranthene	0.33	0.072
Benzo(k)fluoranthene	0.24	0.035
Benzo(a)pyrene	0.31	0.046
Perylene	0.094	0.011
Indeno(1,2,3-c,d)pyrene	0.39	0.058
Dibenzo(a,h)anthracene	0.08	0.026
Benzo(g,h,i)perylene	0.35	0.057
Total PAHs	3.438	0.651

* All Units are ug/g unless otherwise specified.

SEDIMENT ANALYSES

Sample ID	A5 0-10	A5 20-30	A5 40-50	A5 60-70
Sample Date	07/88	07/88	07/88	07/88
Sampling Level	2	1	2	1
BAS Reference Number	8808085-08	8808085-01	8808085-09	8808085-02
pH	11.0	11.1	10.9	10.6
Specific Conductance (uS/cm)	1320	1460	1320	548
Loss on Ignition (%)	2.6/2.4	3.1	2.4	1.38
Moisture Content (%)	23/23	15.6	16.5	16.3
Phenols	<0.5	<0.5	<0.5	<0.5
Oil & Grease	550	340	430	98
Total Phosphorous	580	-	700	-
Bromide	-	<2	-	<2
Chloride	-	17.1/16.5	-	26
Fluoride	-	19.4	-	2.7
Nitrate-N	-	<0.2	-	1.6
Ammonia-N	14	-	9	-
Total Kjeldahl Nitrogen	42	-	23	-
Sulphate	-	560	-	184
Zinc	46	55	65/61	31
Cadmium	<0.05	<0.05	<0.05	<0.05
Manganese	23000	34000	33000	3600
Cobalt	13	17	16/16	8
Copper	33	36	33/33	12
Iron	87000	144000	127000	32000
Lead	85	55	89/92	8
Chromium	300	430	400/380	60
Nickel	27	34	47	12
Beryllium	1	-	1/1	-
Molybdenum	10	-	12/12	-
Calcium	65000	-	97000	-
Vanadium	160	-	210/200	-
Aluminum	9800	-	11100	-
Magnesium	15900	-	21000	-
Barium	42	-	57/58	-
Potassium	830	-	980/930	-
Strontium	54	-	76/76	-
Sodium	1470	-	1920/1900	-
PAHs				
Naphthalene	0.093	-	0.063	-
Acenaphthylene	0.16	-	0.21	-
Acenaphthene	0.26	-	0.32	-
Fluorene	0.26	-	0.34	-
Phenanthrene	2.4	-	2.7	-
Anthracene	0.44	-	0.49	-
Fluoranthene	4.0	-	3.7	-
Pyrene	2.5	-	2.4	-
Benzo(a)anthracene	1.53	-	1.53	-
Chrysene	1.55	-	1.52	-
Benzo(b)fluoranthene	2.2	-	2.2	-
Benzo(k)fluoranthene	1.32	-	1.54	-
Benzo(a)pyrene	2.22	-	2.5	-
Perylene	0.75	-	0.82	-
Indeno(1,2,3-c,d)pyrene	2.4	-	2.8	-
Dibenzo(a,h)anthracene	0.56	-	0.48	-
Benzo(g,h,i)perylene	1.53	-	1.67	-
Total PAHs	24.17	-	25.28	-

*** All Units are ug/g unless otherwise specified.**

SEDIMENT ANALYSES

Sample ID	B1 0-25	B1 0-25 Duplicate	B1 50-75	B1 100-125	B1 150-175	B1 200-225	B1 260-270
Sample Date	07/88	07/88	07/88	07/88	07/88	07/88	07/88
Sampling Level	2	2	1	2	1	1	2
BAS Reference Number	8808085-10	8808085-13	8808085-03	8808085-11	8808085-04	8808085-05	8808085-12
pH	10.6	7.0	7.0	7.2	7.3	6.7	6.9/7.0
Specific Conductance (uS/cm)	406	391	368	273	329	149	47/51
Loss on Ignition (%)	12.5	10.2	3.8	1.84	1.84	1.15	0.40
Moisture Content (%)	51	53	31	26	30	23	16.1
Phenols	1.2	1.1	<0.5	<0.5	<0.5	<0.5	<0.5
Oil & Grease	6200	5400	690	150	91	55/110	52
Total Phosphorous	690/700	720	-	340	-	-	110
Bromide	-	-	<2	-	<2/<2	<2	-
Chloride	-	-	10.2	-	15/23	5.3	-
Fluoride	-	-	3.5	-	5.5/5.4	3.6	-
Nitrate-N	-	-	0.6	-	1.08/<0.5	0.5	-
Ammonia-N	24/22	29	-	22	-	-	12
Total Kjeldahl Nitrogen	1140	1320	-	580/630	-	-	168
Sulphate	-	-	185	-	68/74	81	-
Zinc	760/750	730	54	26	29/28	18	6
Cadmium	0.95/0.95	0.90	0.10	0.05	0.05/0.05	0.05	<0.05
Manganese	14100	12200	430	163	200/195	123	54
Cobalt	16/19	16	5	6	7/7	4	2
Copper	54/59	54	9	8	12/11	7	3
Iron	95000	87000	11400	10000	13500	8700	5100
Lead	187/195	173	13	5	7/8	4	2
Chromium	230/260	220	18	19	26/25	16	6
Nickel	34/44	36	8	10	14/13	8	4
Beryllium	1/2	2	-	<1	-	-	<1
Molybdenum	8/8	8	-	<2	-	-	<2
Calcium	56000	50000	-	3800	-	-	1100
Vanadium	119/127	115	-	29	-	-	15
Aluminum	14100	14600	-	8200	-	-	2600
Magnesium	15600	13700	-	2600	-	-	900
Barium	83/84	89	-	30	-	-	10
Potassium	1670/1860	1920	-	1240	-	-	400
Strontium	70/70	71	-	18	-	-	6
Sodium	1520/1670	1510	-	460	-	-	165
PAHs							
Naphthalene	46	115	-	0.34	-	-	0.001
Acenaphthylene	4.5	4.8	-	0.014	-	-	<0.001
Acenaphthene	3.1	3.5	-	0.012	-	-	<0.001
Fluorene	8.5	8.3	-	0.020	-	-	<0.001
Phenanthrene	2.4	27	-	0.146	-	-	0.007
Anthracene	14.0	12.3	-	0.061	-	-	<0.001
Fluoranthene	15.1	16.4	-	0.20	-	-	0.001
Pyrene	11.6	12.8	-	0.173	-	-	0.004
Benzo(a)anthracene	8.9	10.4	-	0.130	-	-	<0.002
Chrysene	8.7	9.9	-	0.150	-	-	<0.002
Benzo(b)fluoranthene	10.1	12.6	-	0.172	-	-	<0.005
Benzo(k)fluoranthene	5.9	6.7	-	0.106	-	-	<0.005
Benzo(a)pyrene	12.5	14.8	-	0.159	-	-	<0.005
Perylene	4.8	5.9	-	0.085	-	-	<0.005
Indeno(1,2,3-c,d)pyrene	10.5	12.7	-	0.165	-	-	<0.01
Dibenzo(a,h)anthracene	3.2	4.3	-	0.042	-	-	<0.02
Benzo(g,h,i)perylene	8.7	10.4	-	0.162	-	-	<0.01
Total PAHs	178.5	287.8	-	2.137	-	-	0.013

* All Units are ug/g unless otherwise specified.

GROUNDWATER TRITIUM ANALYSES

FACULTY OF SCIENCE

University of Waterloo
Waterloo, Ontario
N2L 3G1
Tel: (519) 885-1211; Ext. 6387

FACSIMILE MESSAGE SHEET

Date: APRIL 13/89

Attention: Ms. Berry-Spark

Company: Beak

Department: _____

Fax #: 416 458 7303

From: Mary Ellen Patton

No. of Pages sent (including this page) 2

OUR FAX NUMBER IS: 519-746-2543

**IF YOU DID NOT RECEIVE ALL PAGES,
PLEASE NOTIFY US AS SOON AS POSSIBLE.**

THANK YOU.

Account No.: 652-4310-06

Condensed Data output for File ISO#- 890653 Barry-Spark/BEAK 03/20/89 LOCATION E - 1

LAB#	Sample	18Osmow	2H	3H	EH3	13C	18Opdb	34S	18Oso4
19384	A4-1				1.2 +/- 0.8				
19385	B4-1				4.8 +/- 0.7				
19386	B2-3				25.6 +/- 1.9				
19387	D3-1				<0.8 +/- 0.6				
19388	D5-1				43.3 +/- 3.0 44.4 +/- 3.1				

TELEFAX TO: KAREN BERRY-SPARK, BEAK CONSULTANTS

TELEFAX NO: 416-458-7303

TELEFAX FROM: MARY ELLEN PATTON, EIL, UNIVERSITY OF WATERLOO

DATE: APRIL 13, 1989

University of Waterloo

Waterloo, Ontario, Canada
N2L 3G1

Faculty of Science
Department of Earth Sciences
519/885-1211

Telex Number
069-55259

Rec'd
18 July '89

Environmental Isotope Lab.
Earth Sciences Department
July 12, 1989

Ms. K. Berry-Spark
Contaminant Hydrogeologist
Beak Consultants Limited
14 Abacus Road
Brampton, Ontario
L6T 5B7

Dear Karen:

Enclosed please find the results of the testing done on the samples you submitted to our lab last month. I hope you are happy with them. I have also faxed these results to you.

As storage space here is scarce, I would appreciate some direction from you as to disposal of these samples. If I do not hear from you within two months (i.e. by September 12, 1989) I will throw them out.

A bill (at priority rates) for these analyses will arrive shortly.

Yours truly

Mary Ellen

Mary Ellen Patton

Condensed Data output for File ISO#- 890158 Berry-Spark/BEAK 06/13/89 LOCATION C - 1

LAB#	Sample	18Osmow	2H	3H	EH3	13C	18Opdb	34S	18Oso4
20791	B2-1				48.6 +/- 3.1				
					50.8 +/- 3.4				
20792	A7-1				68.3 +/- 4.6				
20793	B2-3				24.2 +/- 1.8				

GROUNDWATER & ST. MARYS RIVER
SEEPAGE WATER - VOLATILE
ORGANIC COMPOUNDS AND
PHENOLS SPECIES ANALYSES

NOVALAB LTÉE LTD

9420 CÔTE DE LIESSE, LACHINE, QUÉ. H8T 1A1

TÉL.: (514) 636-6218, 631-1838
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FAX: (514) 631-9814

TO: Beak Consultants Ltd
14 Abacus Road
Brampton, Ontario
L6T 5B7

Attention: Mr. J.L. Robertson

DATE: Nov. 11, 1988

CLIENT ORDER #: 2460-3

REPORT #: NL-4211

RE: Analysis of Water Samples

Sir,

Twenty-eight (28) water samples in four (4) groups were received between August 12 and September 6, 1988. Four (4) trip blank samples sent in August were requested not to be analysed. The list of samples received are shown in Table 1. Sixteen (16) of the water samples and one trip blank were analysed for volatile priority pollutants by purge and trap gc/ms (MISA groups 16 and 17). Six (6) of the water samples and one trip blank were analysed for phenolic compounds by gc/ms. These samples were in-situ acetylated prior to the extraction. Among these six (6) water samples, two (2) samples containing the highest amount of phenolic compounds were re-analysed, without acetylation, by gc/ms for nitrophenols at lower detection limits.

The phenolic pollutants analyses were performed on a Hewlett-Packard gc/ms MSD system, and volatile pollutants analyses were performed using a Unacon concentrator interfaced to a Finnigan Ion Trap detector. Library searches were conducted on samples containing other compounds with concentration in excess of 50 µg/L. Sample spectra were compared to the NBS reference library. Results are shown in the attached Tables.

Chromatograms will be kept on file. Results are not corrected for recovery.

Sincerely,

NOVALAB LIMITED

L.W. Tang, B.Sc.

Approved by J.D. Fenwick, Ph.D., P.Chem.

LWT/hl
encl.

All reports are the confidential property of clients. Publication of statements, conclusions or extracts regarding our reports is not permitted without our written approval. Any liability attached thereto is limited to the fee charged. Unless otherwise arranged samples will be discarded 90 days after receipt.

Table 1

Summary of Water Samples Received

Date Received	Amount of Sample	Sample Identification	Analysis Required
12/8/88	2	Trip Blank * C4	Phenolics
	6	Trip Blank * C4 A2-1 A5 A2-2 D3-2	Volatile Pollutants
15/8/88	2	SW1 SW1 Trip Blank *	Phenolics
	4	SW1 SW1 Trip Blank * SW2 SW5	Volatile Pollutants
1/9/88	3	A1-2 B1 GWTB2 Trip Blank	Phenolics
	4	A1-2 GWTB2 Trip Blank B1 B2-2	Volatile Pollutants
6/9/88	2	SP-A2 SP-P47	Phenolics
	5	SP-A1 SP-A2 SP-A3 SP-P47 B2-1	Volatile Pollutants

* These trip blanks were requested not to be analysed.

NL-4211

Forensic Scan Analysis - Volatiles Compounds

Sample : A2-2

Scan	Time (min)	Identification
1319	22:00	C_9H_8 CAS 673-32-5
1506	25:07	Naphthalene

Sample : D3-2

Scan	Time (min)	Identification
1504	25:05	Naphthalene

Sample : C4

Scan	Time (min)	Identification
1504	25:05	Naphthalene

Sample : B1

Scan	Time (min)	Identification
1272	21:13	Benzofuran (C_8H_6O)
1332	22:13	C_9H_8 CAS 673-32-5
1370	22:52	$C_{10}H_{12}$ Isomers
1431	23:52	
1449	24:10	Methyl benzofuran CAS 17059-52-8
1395	23:16	C_9H_8O
1401	23:22	
1457	24:19	Butynyl benzene
1469	24:31	$C_{10}H_{10}$ CAS 622-76-4
1521	25:22	Naphtalene
1529	25:31	Benzothiopene C_8H_6S CAS 95-15-8

Forensic Scan Analysis - Volatiles Compounds (cont'd)

Sample : A1-2

Scan	Time (min)	Identification
375	6:16	Acetone
597	9:58	Methyl ethyl ketone
1329	22:10	C_9H_8
1404	23:25	Methyl benzofuran C_9H_8O CAS 17059-52-8
1455	24:15	Butynyl benzene
1467	24:29	$C_{10}H_{10}$ CAS 622-76-4
1516	25:17	Naphthalene
1533	25:35	Benzothiopene C_8H_6S CAS 95-15-8

Forensic Scan Analysis - Extractable Compounds

Sample : A1-2

Time (min)	Identification
11.2	Benzoic acid
12.1	Methyl benzoic acid
12.3	$C_8H_8O_2$
12.5	$C_7H_{10}O$ CAS 497-38-1
13.2	Methyl benzeneacetic acid $C_9H_{10}O_2$ CAS 492-37-5
15.5	Ar-ethenyl benzeneacetic acid $C_{10}H_{10}O_2$ CAS 37570-14-2

CONCENTRATION OF ACIDIC PRIORITY POLLUTANTS IN WATER
ug/L

COMPOUND	A1-2±	B-1±	LAB BLANK	MDL
PHENOL	360	6	-	2
2-CHLOROPHENOL	-	-	-	2
2,4-DIMETHYLPHENOL	-	-	-	10
4-CHLORO-3-METHYLPHENOL	-	-	-	2
2,4-DICHLOROPHENOL	-	-	-	2
2,4,6-TRICHLOROPHENOL	-	-	-	2
2-NITROPHENOL	-	-	-	4
2,4-DINITROPHENOL	-	-	-	10
2-METHYL-4,6-DINITROPHENOL	-	-	-	10
4-NITROPHENOL	-	-	-	10
PENTACHLOROPHENOL	-	-	-	5
2,6-DICHLOROPHENOL	-	-	-	2
OTHER TRICHLOROPHENOLS	-	-	-	2
TETRACHLOROPHENOLS	-	-	-	5
M+P-CRESOL	88	-	-	2
O-CRESOL	7.6	TR	-	2
OTHER DIMETHYL PHENOLS	12	57	-	10
TRIMETHYL PHENOLS	-	-	-	10

MDL = METHOD DETECTION LIMIT

TR = TRACE

± Samples were analysed without acetylation.

RECOVERY OF SURROGATE STANDARDS
(%)

COMPOUND	A1-2	B-1	LAB BLANK
D5-PHENOL	9.2	64.3	40
TRIFLUOROMETHYL-M-CRESOL	54.9	83	71.5

CONCENTRATION OF ACIDIC PRIORITY POLLUTANTS IN WATER
ug/L

COMPOUND	A1-2	B-1	TRIP BLANK GWTB2	LAB BLANK	MDL
PHENOL	170	-	-	-	1
2-CHLOROPHENOL	-	-	-	-	1
2,4-DIMETHYLPHENOL	-	-	-	-	1
4-CHLORO-3-METHYLPHENOL	-	-	-	-	1
2,4-DICHLOROPHENOL	-	-	-	-	1
2,4,6-TRICHLOROPHENOL	-	-	-	-	1
2-NITROPHENOL	-	-	-	-	2
2,4-DINITROPHENOL	-	-	-	-	100
2-METHYL-4,6-DINITROPHENOL	-	-	-	-	25
4-NITROPHENOL	-	-	-	-	100
PENTACHLOROPHENOL	-	-	-	-	1
2,6-DICHLOROPHENOL	-	-	-	-	1
2,3,4-TRICHLOROPHENOL	-	-	-	-	1
2,3,5-TRICHLOROPHENOL	-	-	-	-	1
2,4,5-TRICHLOROPHENOL	-	-	-	-	1
2,3,4,5-TETRACHLOROPHENOL	-	-	-	-	1
2,3,4,6-TETRACHLOROPHENOL	-	-	-	-	1
2,3,5,6-TETRACHLOROPHENOL	-	-	-	-	1
M-CRESOL	28	-	-	-	1
P-CRESOL	41	-	-	-	1
O-CRESOL	10	-	-	-	1
OTHER DIMETHYL PHENOLS	22	80	-	-	1
TRIMETHYL PHENOLS	-	-	-	-	1

MDL = METHOD DETECTION LIMIT

Note : Samples were in-situ acetylated prior to the extraction.

RECOVERY OF SURROGATE STANDARDS
(%)

COMPOUND	A1-2	B-1	TRIP BLANK GWTB2	LAB BLANK
D5-PHENOL	15.2	77.1	91.2	96.3
TRIFLUOROMETHYL-M-CRESOL	17.9	78	94.5	100

CONCENTRATION OF ACIDIC PRIORITY POLLUTANTS IN WATER
ug/L

COMPOUND	SP-A2	SP-P77	BLANK	MDL
PHENOL	1	-	-	1
2-CHLOROPHENOL	-	-	-	1
2,4-DIMETHYLPHENOL	-	-	-	1
4-CHLORO-3-METHYLPHENOL	-	-	-	1
2,4-DICHLOROPHENOL	-	-	-	1
2,4,6-TRICHLOROPHENOL	-	-	-	1
2-NITROPHENOL	-	-	-	2
2,4-DINITROPHENOL	-	-	-	100
2-METHYL-4,6-DINITROPHENOL	-	-	-	25
4-NITROPHENOL	-	-	-	100
PENTACHLOROPHENOL	-	-	-	1
2,6-DICHLOROPHENOL	-	-	-	1
2,3,4-TRICHLOROPHENOL	-	-	-	1
2,3,5-TRICHLOROPHENOL	-	-	-	1
2,4,5-TRICHLOROPHENOL	-	-	-	1
2,3,4,5-TETRACHLOROPHENOL	-	-	-	1
2,3,4,6-TETRACHLOROPHENOL	-	-	-	1
2,3,5,6-TETRACHLOROPHENOL	-	-	-	1
M-CRESOL	-	-	-	1
P-CRESOL	-	-	-	1
O-CRESOL	-	-	-	1
OTHER DIMETHYL PHENOLS	-	-	-	1
TRIMETHYL PHENOLS	-	-	-	1

MDL = METHOD DETECTION LIMIT

Note : Samples were in-situ acetylated prior to the extraction.

RECOVERY OF SURROGATE STANDARDS
(%)

COMPOUND	SP-A2	SP-P77	BLANK
D5-PHENOL	94.6	92.1	96.3
TRIFLUOROMETHYL-M-CRESOL	97	97	100

CONCENTRATION OF ACIDIC PRIORITY POLLUTANTS IN WATER
ug/L

COMPOUND	C4	BLANK	MDL
PHENOL	-	-	1
2-CHLOROPHENOL	-	-	1
2,4-DIMETHYLPHENOL	-	-	1
4-CHLORO-3-METHYLPHENOL	-	-	1
2,4-DICHLOROPHENOL	-	-	1
2,4,6-TRICHLOROPHENOL	-	-	1
2-NITROPHENOL	-	-	2
2,4-DINITROPHENOL	-	-	100
2-METHYL-4,6-DINITROPHENOL	-	-	25
4-NITROPHENOL	-	-	100
PENTACHLOROPHENOL	-	-	1
2,6-DICHLOROPHENOL	-	-	1
2,3,4-TRICHLOROPHENOL	-	-	1
2,3,5-TRICHLOROPHENOL	-	-	1
2,4,5-TRICHLOROPHENOL	-	-	1
2,3,4,5-TETRACHLOROPHENOL	-	-	1
2,3,4,6-TETRACHLOROPHENOL	-	-	1
2,3,5,6-TETRACHLOROPHENOL	-	-	1
M-CRESOL	-	-	1
P-CRESOL	-	-	1
O-CRESOL	TR	-	1
OTHER DIMETHYL PHENOLS	4	-	1
TRIMETHYL PHENOLS	-	-	1

MDL = METHOD DETECTION LIMIT

TR = TRACE

Note : Samples were in-situ acetylated prior to the extraction.

RECOVERY OF SURROGATE STANDARDS
(%)

COMPOUND	C4	BLANK
D5-PHENOL	100	100
TRIFLUOROMETHYL-M-CRESOL	100	100

CONCENTRATION OF VOLATILE PRIORITY POLLUTANTS IN WATER

ug/L

COMPOUND	A2-1	A2-2	A5	C4	D3-2	BLANK	MDL
BENZENE	4.1	130	-	2.4	-	-	1
BROMODICHLOROMETHANE	-	-	-	-	-	-	1
BROMOFORM	-	-	-	-	-	-	2
BROMOMETHANE	-	-	-	-	-	-	16
CARBON TETRACHLORIDE	-	-	-	-	-	-	2
CHLOROBENZENE	-	-	-	-	-	-	1
CHLOROETHANE	-	-	-	-	-	-	10
2-CHLOROETHYL VINYL ETHER	-	-	-	-	-	-	10
CHLOROFORM	-	-	-	-	-	-	1
CHLOROMETHANE	-	-	-	-	-	-	50
DIBROMOCHLOROMETHANE	-	-	-	-	-	-	1
1,2-DICHLOROBENZENE	-	-	-	-	-	-	1
1,3-DICHLOROBENZENE	-	-	-	-	-	-	1
1,4-DICHLOROBENZENE	-	-	-	-	-	-	1
1,1-DICHLOROETHYLENE	-	-	-	-	-	-	1
1,1-DICHLOROETHANE	-	-	-	-	-	-	1
1,2-DICHLOROETHANE	-	-	-	-	-	-	2
TRANS-1,2-DICHLOROETHYLENE	-	2.4	-	-	-	-	1
DICHLOROMETHANE	-	-	-	23	26	-	15
1,2-DICHLOROPROPANE	-	-	-	-	-	-	1
CIS-1,3-DICHLOROPROPENE	-	-	-	-	-	-	1
TRANS-1,3-DICHLOROPROPENE	-	-	-	-	-	-	1
ETHYLBENZENE	-	3.3	-	-	-	-	1
A-METHYLSTYRENE	-	-	-	-	-	-	1
METHYLSTYRENE ISOMERS	-	-	-	-	-	-	1
MESITYLENE	-	-	-	-	-	-	1
1,1,2,2-TETRACHLOROETHANE	-	-	-	-	-	-	2
TETRACHLOROETHYLENE	-	1.9	3	1.3	2.4	-	1
TOLUENE	19	4.8	4.8	6.1	-	-	2
1,1,1-TRICHLOROETHANE	-	-	-	-	-	-	2
1,1,2-TRICHLOROETHANE	-	-	-	-	-	-	1
TRICHLOROETHYLENE	1.3	20	-	-	-	-	1
TRICHLOROFLUOROMETHANE	-	3.3	-	-	-	-	2
M+P-XYLENE	-	5.9	-	TR	-	-	2
O-XYLENE	-	7.8	-	1.5	-	-	1
VINYL CHLORIDE	-	-	-	-	-	-	12
METHYL ETHYL KETONE	-	-	-	-	-	-	20
CUMEN	-	-	-	-	-	-	1
PROPYL BENZENE	-	-	-	-	-	-	1
M+P-ETHYL TOLUENE	-	TR	-	1.2	-	-	1
O-ETHYL TOLUENE	-	1	-	2.5	-	-	1
DIBROMOETHANE	-	-	-	-	-	-	5
CIS-1,2-DICHLOROETHYLENE	1.8	41	-	-	-	-	1
STYRENE	-	2.7	-	-	-	-	2
OTHER AROMATIC COMPOUNDS	-	11	-	24	-	-	1

MDL = METHOD DETECTION LIMITS
TR - TRACE

OTHER AROMATIC COMPOUNDS = Total concentration of trimethylbenzenes using the response factor of mesitylene.

CONCENTRATION OF VOLATILE PRIORITY POLLUTANTS IN WATER
ug/L

COMPOUND	SP-A1	SP-A2	SP-A3	SP-P47	S2-1	BLANK	MDL
BENZENE	-	-	-	-	-	-	1
BROMODICHLOROMETHANE	-	-	-	-	-	-	1
BROMOFORM	-	-	-	-	-	-	2
BROMOMETHANE	-	-	-	-	-	-	16
CARBON TETRACHLORIDE	-	-	-	-	-	-	2
CHLOROBENZENE	-	-	-	-	-	-	1
CHLOROETHANE	-	-	-	-	-	-	10
2-CHLOROETHYL VINYL ETHER	-	-	-	-	-	-	10
CHLOROFORM	-	-	-	-	-	-	1
CHLOROMETHANE	-	-	-	-	-	-	50
DIBROMOCHLOROMETHANE	-	-	-	-	-	-	1
1,2-DICHLOROBENZENE	-	-	-	-	-	-	1
1,3-DICHLOROBENZENE	-	-	-	-	-	-	1
1,4-DICHLOROBENZENE	-	-	-	-	-	-	1
1,1-DICHLOROETHYLENE	-	-	-	-	-	-	1
1,1-DICHLOROETHANE	-	-	-	-	-	-	1
1,2-DICHLOROETHANE	-	-	-	-	-	-	2
TRANS-1,2-DICHLOROETHYLENE	-	-	-	-	-	-	1
DICHLOROMETHANE	-	-	-	-	32	-	10
1,2-DICHLOROPROPANE	-	-	-	-	-	-	1
CIS-1,3-DICHLOROPROPENE	-	-	-	-	-	-	1
TRANS-1,3-DICHLOROPROPENE	-	-	-	-	-	-	1
ETHYLBENZENE	-	-	-	-	-	-	1
A-METHYLSTYRENE	-	-	-	-	-	-	1
METHYLSTYRENE ISOMERS	-	-	-	-	-	-	1
MESITYLENE	-	-	-	-	-	-	1
1,1,2,2-TETRACHLOROETHANE	-	-	-	-	-	-	2
TETRACHLOROETHYLENE	-	-	-	-	-	-	1
TOLUENE	-	-	-	-	-	-	2
1,1,1-TRICHLOROETHANE	-	-	-	-	-	-	2
1,1,2-TRICHLOROETHANE	-	-	-	-	-	-	1
TRICHLOROETHYLENE	-	-	-	-	-	-	1
TRICHLOROFLUOROMETHANE	-	-	-	2.1	7.1	-	2
M+P-XYLENE	-	-	-	-	-	-	2
O-XYLENE	-	-	-	-	-	-	1
VINYL CHLORIDE	-	-	-	-	-	-	12
METHYLETHYL KETONE	-	-	-	-	-	-	20
CUMEN	-	-	-	-	-	-	1
M+P-ETHYL TOLUENE	-	-	-	-	-	-	1
O-ETHYL TOLUENE	-	-	-	-	-	-	1
DIBROMOETHANE	-	-	-	-	-	-	5
STYRENE	-	-	-	-	-	-	2
OTHER AROMATIC COMPOUNDS	-	-	-	-	-	-	1

MDL = METHOD DETECTION LIMITS

OTHER AROMATIC COMPOUNDS = Total concentration of trimethylbenzenes using the response factor of mesitylene.

QA/QC RESULTS - SUMMER 1988

ANALYTICAL QUALITY ASSURANCE/QUALITY CONTROL

A1.0 INTRODUCTION

Environmental questions related to the potential release of contaminants from the slag disposal site of Algoma Steel at Sault Ste. Marie require high quality analytical data. This document presents a brief summary of the Quality Assurance/Quality Control (QA/QC) program in effect at Beak Analytical Services (BAS) and QC results specific to the Algoma project. As a source for many of its QA/QC policies, BEAK has relied heavily on such documents as EPA's Handbook for Analytical Quality Control in Water and Wastewater Laboratories (EPA-600/4-79-019) and numerous QA/QC publications produced by the Ontario Ministry of the Environment.

A1.1 Format

The QA/QC policies employed by BAS in the handling and analysis of Algoma samples are discussed under the separate categories listed below:

1. Chain of Custody Procedure/Sample Handling
2. Quality Assurance Procedures
3. Quality Control Procedures
4. Corrective Action
5. Performance Evaluation Audits

A2.0 CHAIN-OF-CUSTODY PROCEDURES AND SAMPLE HANDLING

Since the results of chemical analyses are often used to support litigation, the chain-of-custody of both samples and results is strictly controlled and documented. Following U.S. EPA guidelines, one person, Ms. Karen Kaufman, is assigned the job of laboratory sample custodian and assumes custody of the samples on behalf of the laboratory.

The samples are preserved, if necessary, then logged into a computerized Laboratory Information Management System (LIMS). During log-in, each sample is assigned a unique, sequential identification number which is affixed to each sample. The laboratory custodian also enters the person delivering the samples, the date and time of their

receipt the source of the sample (client), the type of sample, the condition of the parameters to be measured, whether the sample has been preserved and the storage location. The LIMS then generates an analysis sheet to be used at the bench. Samples are stored in the assigned location in the fridge or sample area. These areas, and indeed the laboratory itself, are accessible only to authorized personnel. Priority analyses such as pH are performed upon receipt of the samples.

The laboratory supervisor assigns the priority and the analyst to each analysis. The analyst conducts the analysis and submits the results for entering into the LIMS. The raw data for each analysis are recorded in each analyst's bound notebook or in a parameter workbook. The LIMS generates a final report for the client. Final results, including the quality control data, are reviewed by the quality control officer or laboratory supervisor who authorizes release of the data to the project manager.

Once the sample analyses are completed, the unused portion of the sample, together with all identifying labels, are returned to the sample storage area. The returned samples are retained until permission to destroy the sample is received from the project manager or client, or the recommended maximum holding time has lapsed.

A3.0 QUALITY ASSURANCE PROCEDURES

In this section are briefly discussed measures and procedures taken at BEAK to ensure the high quality of results submitted to clients. Most of these measures are discussed in EPA (1979) and other QA/QC documents.

A3.1 Analytical Methods

All analytical methods used at BAS are clearly referenced, and are either identical, or very similar, to methods produced by standard-setting organizations such as the U.S. EPA, the Ontario Ministry of the Environment (MOE), APHA (Standard Methods) and Environment Canada. Any modifications to these methods such as changes in scale or concentrations are recorded in BEAK's Methods Manual.

A3.1.2 Methods Specific to Algoma Samples

Inorganic Parameters

Methods of inorganic analysis specific to the Algoma project are presented in Table A1. Dissolved inorganic carbon (DIC) and dissolved organic carbon (DOC) were analyzed colormetrically (phenolphthalein indicator) on a Technicon auto analyzer. Alkalinity was measured titrametrically on a Radiometer VIT90 auto titrator. Phenols were determined colormetrically on a Technicon auto analyzer using the potassium ferricyanide method. Sulphides were determined by the methylene-blue technique (Standard Methods). Total cyanide was determined colormetrically (manual method) with chloramine T and pyridine-pyrazolone after acid distillation. Total phosphorus was determined colormetrically (molybdate reaction) on a Technicon auto analyzer after acid digestion. Bromide, fluoride, sulphate and nitrate were determined by ion chromatography (Dionex 2000I). Ammonia was analyzed colormetrically (nitroprusside method) on a Technicon IV auto analyzer. Total Kjeldahl nitrogen was determined colormetrically (salicylate-nitroprusside-hypochlorite) on a Technicon IV auto analyzer after acidic digestion.

All metals in waters, leachates and soil extracts were analyzed by direct current plasma emission spectrometry (DCP, Beckman Spectrospan V), with the exception of cadmium, arsenic, selenium and mercury. Cadmium was analyzed by Zeeman corrected graphite furnace atomic absorption spectrometry (GFAAS, Perkin Elmer 3030). Arsenic and selenium concentrations were measured by hydride generation on a dedicated Perkin Elmer 303 atomic absorption spectrophotometer (Standard Methods, 1985). Mercury was determined by cold vapour flameless atomic absorption spectrometry (Hames, 1983). Soils and sediments were analyzed for metals by digesting approximately 0.5 g at 100°C for 12 hours in 10 mL of aqua regia and diluting to 25 mL.

Conductivity and pH determinations on soils were made on a distilled water slurry (1:1). Other dissolved components in soils (Br, Cl, F, NO_3, etc.) were measured on a (1:20) suspension of the soil with distilled deionized water. Three types of soil leachates were run, an Ontario Regulation 309, an alkaline leachate using 0.5N NaOH (pH 10±0.2) and an acidic leachate using 0.5N HCl (pH 5±0.2).

TABLE A1: METHOD OF ANALYSIS OF INORGANIC PARAMETERS

Parameter	Matrix	Analysis
pH	water[1]	pH meter
Alkalinity	water	titrametric-Radiometer VIT90 autotitrator
Dissolved Organic Carbon	water	colormetric (automated-Technicon 4)
Phenols	water	colormetric (automated-Technicon 4)
Loss-on-Ignition	sediment/soil	gravimetric
Cyanide	water	colormetric-pyridine-pyrazolone manual
Bromide	water	ion chromatography (Dionex 2000I)
Nitrate	water	ion chromatography (Dionex 2000I)
Chloride	water	ion chromatography (Dionex 2000I)
Fluoride	water	ion chromatography (Dionex 2000I)
Sulphate	water	ion chromatography (Dionex 2000I)
Ammonia	water	colorimetric (automated-Technicon IV)
Total Kjeldahl Nitrogen	water/sediment/soil	colourimetric (automated-Technicon IV)
Total Phosphorus	water/sediment/soil	colourimetric (automated-Technicon IV)/ DCP
Zinc	water/sediment/soil	DCP
Cadmium	water/sediment/soil	DCP/graphite furnace AA
Manganese	water/sediment/soil	DCP
Cobalt	water/sediment/soil	DCP
Copper	water/sediment/soil	DCP
Iron	water/sediment/soil	DCP

TABLE A1: METHOD OF ANALYSIS OF INORGANIC PARAMETERS

Parameter	Matrix	Analysis
Lead	water/sediment/soil	DCP
Chromium	water/sediment/soil	DCP
Nickel	water/sediment/soil	DCP
Beryllium	water/sediment/soil	DCP
Molybdenum	water/sediment/soil	DCP
Calcium	water/sediment/soil	DCP
Vanadium	water/sediment/soil	DCP
Aluminum	water/sediment/soil	DCP
Magnesium	water/sediment/soil	DCP
Barium	water/sediment/soil	DCP
Potassium	water/sediment/soil	DCP
Strontium	water/sediment/soil	DCP
Sodium	water/sediment/soil	DCP
Mercury	water	atomic absorption - cold vapour
Arsenic	water	atomic absorption - hydride generation
Se	water	atomic absorption - hydride generation

[1] includes leachates, seepage water and groundwater

Organic Parameters

Oil and grease was determined gravimetrically after extraction with dichloromethane. PCBs were analyzed by dual capillary GC/ECD. PAHs were analyzed by GC/MS (Hewlett Packard). Halogenated volatiles and non-halogenated volatiles were analyzed by a subcontractor, Novalab Inc., by purge and trap (Unacon) and GC/MS (Finnigan Ion Trap Detector). Phenolics, also analyzed by Novalab, were run on a GC/MS system (Hewlett Packard) after *in situ* acetylation.

A3.2 Sampling Containers and Preservation

Selection of sample containers and sample preservation followed established QA/QC protocols. Sediment samples were collected in new, solvent-rinsed glass jars with foil-lined caps. Water samples for general chemical parameters were collected in new 50 mL high-density polyethylene bottles. Samples for trace metals were collected in new 250 mL bottles of the same material after being soaked in acid for 24 hours and rinsed in distilled deionized water at least three times. Samples for trace metals were preserved in the field with "ultra" grade nitric acid. Separate samples were taken for mercury and were preserved with "ultra" grade nitric acid (1%) and potassium dichromate (5%). A summary of the sampling containers and the preservatives used are presented in Table A2. Samples received were stored in an assigned location in the refrigerator at 4°C.

A3.2.1 Certification of Sampling Bottles

Checks are frequently run on sampling bottles as potential sources of contamination, especially in the analysis of trace metals. Sample bottles are tested by filling them with distilled, deionized water, adding the chemical preservative and allowing them to stand for periods of time up to three months. The results of these tests (Table A3) indicate that, within detection limits, BAS sampling bottles do not present a source of contamination to environmental samples.

A3.2.2 Reagents and Reagent Solutions

One of the major sources of anomalous results outside the limits of random error is contaminated reagents, or reagents which have been incorrectly prepared. Preventing

TABLE A2: BOTTLE TYPES AND PRESERVATIVES USED FOR ALGOMA SAMPLES

Bottle Type	Chemical Parameters	Preservative
500 mL polyethylene	wet chemical	none
500 mL polyethylene	cyanide	sodium hydroxide
250 mL polyethylene	metals	nitric acid
100 mL amber glass	mercury	nitric acid + dichromate
250 mL amber glass	oil and grease	sulphuric acid
250 mL amber glass	phenol	copper sulphate
100 mL amber glass	sulphide	zinc acetate
1,000 mL amber glass	PAH	none
100 mL glass	volatiles	sodium thiosulphate
1,000 mL amber glass	phenolic species	none

TABLE A3: BOTTLE CERTIFICATION TESTS ON TWO LOTS OF SAMPLING BOTTLES FOR TRACE METALS (ug/L)

Parameter	Lot 1		Lot 2		Three-Month Test
	No. 1	No. 2	No. 1	No. 2	
Zinc	L 5	L 5	L 5	L 5	L 5
Cadmium	L 0.1	L 0.1	L 0.1	L 0.1	L 0.1
Copper	0.5	L 0.5	L 0.5	L 0.5	-
Lead	L 1	L 1	L 0.5	L 0.5	L 0.5
Chromium	-	-	L 1	L 1	-
Nickel	-	-	L 1	L 1	-
Aluminum	L 5	L 5	L 5	L 5	-
Mercury	-	-	L 0.05	L 0.05	-
Silver	-	-	L 0.1	L 0.1	-

these errors has become a major objective of our quality assurance program. All standards and reagents are prepared with chemicals which meet the American Chemical Society "anaytical reagent grade" standards. Special reagents are utilized for procedures requiring higher purity, such as "ultra grade" nitric acid in trace metals work. Purchased reagents are labelled with the date the bottle was opened. Reagents are not used past their date of expiration. Reagent solutions prepared in the laboratory are labelled with the date of preparation, the analyst who prepared the solution, the concentrations of active ingredients and an expiration date. Every effort is made to avoid contamination of reagents.

A3.2.3 Laboratory Water

The water used in preparation of reagents and in rinsing of glassware conforms to Type I water described in EPA (1979).

A3.2.4 Quality Control Procedure

Field Quality Control

Field duplicates and trip blanks were taken at a total frequency of 10% at all sampling levels as part of a field quality control program. The duplicate samples provide an estimate of "field precision" or sampling variability. The trip blanks consist of a sample bottle filled with distilled-deionized water taken to the field and preserved in the field as a normal sample. The trip blanks indicate problems of contamination that occur during the sampling/preserving process and normal sample handling.

Duplicate analyses of the groundwater (Sample D1-2), surface waters (SW-3) and sediments (B10-25) indicate that, while results from duplicate analyses generally correspond closely, greater variability exists between field duplicates than between laboratory replicates (Table A4). For example, the halogens chloride and fluoride and sulphate differed by 15 to 50% in D1-2, while laboratory replicates differ generally by less than 5% at these levels (Section A4.2). A large discrepancy in naphthalene is noted in B10-25. Certain trace metal analyses such as cadmium in D1-2 differed significantly as well. These significant differences between duplicates suggest either that the samples are heterogeneous or that some erratic source of contamination exists in the sampling procedure, sample bottles or preservatives.

TABLE A4: SUMMARY OF FIELD DUPLICATES

Sample No.	SW-3	B10-25	D1-2
Matrix	Seepage Water[1] (mg/L)	Sediment[2] (ug/g)	Groundwater[2] (mg/L)
Zn	0.04/0.04	755/730	0.01/0.01
Cd	0.0002/0.0008	0.95/0.90	0.0014/0.004
Mn	0.09/0.09	14,100/12,200	0.01/L 0.01
Co	L 0.01/L 0.01	18/16	0.02/0.02
Cu	L 0.005/L 0.005	57/54	0.010/L 0.005
Fe	0.98/0.98	9,500/8,700	L 0.02/L 0.02
Pb	L 0.05/L 0.05	191/173	L 0.05/L 0.05
Cr	L 0.01/L 0.01	245/220	0.02/0.02
Ni	L 0.01/L 0.01	39/36	0.02/0.01
Be		2/2	
Mo		8/8	
Ca		56,000/50,000	
V		123/115	
Al		14,100/14,600	
Mg		15,600/13,700	
Br		84/89	
K		1,765/1,920	
Sr		70/71	
Nr		1,595/1,510	
Bromide	L 0.1/L 0.1		L 1/L 1
Chloride	9.8/21		230/200
Fluoride	0.08/0.08		0.50/0.75
Sulphide	11.3/11.6		
Sulphate			115/98
NH_3-N		23/29	
NO_3-N	0.54/0.56		L 0.5/L 0.5
TKN		1,140/1,320	
TP		700/720	
DOC	4.0/4.0		9.0/8.5
CN			
Oil and Grease	L 1.0/L 3.0	6,200/5,400	2/1
PCBs			
Phenols	0.004/0.011	1.2/1.1	0.007/0.008
Conductivity (uS/cm)		400/391	1,600/1,600
LOI (%)	-	12.5/10.2	
Naphthalene		46/115	
Acenaphthylene		4.5/4.8	
Acenaphthene		3.1/3.5	
Flourene		8.5/8.3	
Phenanthrene		2.4/27	
Anthracene		14.0/12.3	

TABLE A4: SUMMARY OF FIELD DUPLICATES

Sample No.	SW-3	B10-25	D1-2
Matrix	Seepage Water[1] (mg/L)	Sediment[2] (ug/g)	Groundwater[2] (mg/L)
Fluoranthene		15.1/16.4	
Pyrene		11.6/12.8	
Benzo(a)anthracene		8.9/10.4	
Chrysene		8.7/9.9	
Benzo(b)fluoranthene		10.1/12.6	
Benzo(k)fluoranthene		5.9/6.7	
Benzo(a)pyrene		12.5/14.8	
Perylene		4.8/5.9	
Indeno(1,2,3-c,d)pyrene		10.5/12.7	
Dibenzo(a,h)anthracene		3.2/4.3	
Benzo(g,h,i)perylene		8.7/10.4	
Total PAHs		178.5/287.8	

[1] All units mg/L unless indicated otherwise.
[2] All units ug/g unless indicated otherwise.

Analysis of the trip blanks for inorganics, PAHs and phenol species in groundwater (see Appendix 2 for the data) indicate that only a few parameters were above limits of detection. These include DIC, phenols, oil and grease, iron and naphthalene. In all cases, the levels obtained are only marginally greater than the detection limits and orders of magnitude less than levels in most of the samples. These results suggest that the sampling and preserving procedures are not significant sources of contamination to real samples. The significant differences between field duplicates, therefore, are probably the results of sample heterogeneity.

A4.0 LABORATORY QUALITY CONTROL PROCEDURES

At BEAK Analytical Services (BAS), calibration, precision and accuracy during each analysis are controlled by:

- o calibration control standards,
- o in-run duplicates,
- o control standards,
- o recovery checks (spiking), and
- o performance evaluation audits.

These are discussed under separate sections below.

A4.1 Calibration Control

Following procedures promoted by the Ontario Ministry of the Environment, calibration is confirmed by means of two control standards A and B and a long-term blank which is made up and maintained independently of the calibration standards. The system is not calibrated with these solutions. The calibration control standards A and B are chosen to be about 70% and 20% of full-scale, respectively. The sums (A+B) and differences (A-B) are plotted versus time on a control chart and used immediately by the technician to determine whether the calibration process is in control. The warning and control limits are calculated from the standard deviation of the difference (MOE, 1976). Significant changes in sum (A+B) or difference (A-B) between runs indicates a change in slope or intercept, respectively. Examples of control charts for A-B and A+B are provided at the end of this appendix. An analytical run does not proceed unless statistical control of calibration is demonstrated.

A4.2 Control of Precision

The precision of each analysis at BAS is controlled by within-run duplicates of samples which are run at a frequency of 10%. Duplicate samples are completely separate samples subjected to the entire analytical procedure. The differences between duplicates are accumulated and sorted according to sample concentration ranges. For each range, control limits are calculated for the differences from the Shewhart formula:

$$UCL = 3.267 \times \bar{R} \text{ (ASTM, STP 15D)}$$

where UCL is the upper control limit and $\bar{R}$ is the mean difference between replicates. In general, except at the lower end of the scale, duplicate results should differ by less than 5%. Examples of control charts for differences between duplicates for selected Algoma parameters are found following. Individual results of duplicate analyses are found in the data tables.

Duplicate results are also used to calculate the precision of the analysis for each concentration range. Precision is calculated as the coefficient of variation (standard deviation/mean) where the standard deviation is calculated form the formula:

$$\sqrt{D^2/2K}$$

where D is the difference between dulicates and K is the number of duplicate pairs.

Estimates of precision are presented separately for sediment and water matrices in Tables A5 and A6. The applicable concentration range is indicated for each estimate. As to be expected for some analyses (for example, nickel in water), the coefficient of variation can be as high as 25 to 50% close to the detection limit of the analysis.

A4.2.1 Detection Limits

As in many laboratories, BAS has traditionally reported detection limits which are based on a signal to noise ratio of 2.5. Concentrations less than these limits were reported as "less than" values. BAS is currently in the process of revising its determination of detection limits to be consistent with U.S. EPA and Ontario Ministry of the Environment

TABLE A5: ESTIMATES OF ANALYTICAL PRECISION FOR SELECTED WATER ANALYSES CALCULATED FROM REPLICATE DATA

Parameter	Analytical Method	Concentration Range	Precision as Coefficient of Variation (%)
Zn	DCP	L 0.05	9.9
		0.05-1.0	6.3
		GT 1.0	3.4
Cd	GFAAS	L 0.001	17.0
		0.001-0.0025	8.7
		GT 0.0025	4.1
Mn	DCP	L 0.1	15.0
		0.1-1.0	3.6
		GT 1.0	2.1
Cr	DCP	L 0.05	29.0
		0.05-1.0	6.7
Ni	DCP	L 0.05	11.5
		0.05-1.0	9.1
Cu	DCP	1-20	2.9
		20-50	4.0
		50-100	1.6
Al	DCP	0.05-1.0	35.7
		1.0-5.0	7.4
		5.0-20	6.9
Mg	DCP	0.05-20	4.2
		20-50	1.3
K	DCP	1-5	5.6
		5-12.5	5.4
		12.5-25	4.2
Na	DCP	0.5-20	5.4
		20-50	2.4
		50-100	2.5
Hg	Cold Vapour A.A.	L 0.0005	27.3
		0.0005-0.001	12.1
		GT 0.001	11.2

TABLE A5: ESTIMATES OF ANALYTICAL PRECISION FOR SELECTED WATER ANALYSES CALCULATED FROM REPLICATE DATA

Parameter	Analytical Method	Concentration Range	Precision as Coefficient of Variation (%)
As		L 0.010 GT 0.025	10.7 9.3
Se	Hydride Generation	L 0.001 0.001-0.002	42.3 23.3
Conductivity	Conductivity Meter	0-100 uS/cm	2.0
NH_3-N	Technicon 2	0.010-0.070	10.8
NO_3-N	Ion Chromatography	0.01-0.23 0.23-0.56	11.5 5.9
Cl	Ion Chromatography	0-10 10-50	1.32 2.4
SO_4	Ion Chromatography	5-19	0.8

* Provisional, based on only 3 to 5 points.

L = less than.

GT = greater than.

TABLE A6: ESTIMATES OF ANALYTICAL PRECISION FOR SELECTED SEDIMENT ANALYSES CALCULATED FROM REPLICATE DATA

Parameter	Analytical Method	Concentration Range (ug/g)	Precision as Coefficient of Variation (%)
Zn	DCP	L 50	3.6
Cr	DCP	L 50	3.6
		50-100	4.5
		GT 100	6.0
Ni	DCP	L 15	8
		15-20	3.7
		GT 50	1.17
Al	DCP		
Hg	Cold Vapour A.A.	L 0.5	27.3
		L 10	11.3
As	Hydride Generation	10-25	10.0
Se	Hydride Generation	L 1	42.3
		1-2	23.3

N.A. - Date not available.

L - less than.

GT - greater than.

regulations. These regulatory bodies advocate calculation of a method detection limit based on the standard deviation of within-run replicates and Students-t. A detection limit calculated in this way corresponds to the criterion of detection which is defined as the concentration at which the probability is 5% of reporting an analyte which is not really present (ASTM, 1985). Table A7 presents detection limits in water reported at BAS by both methods. In general, detection limits reported in this study were based on the traditional signal to noise ratio. In future samplings, statistically determined method detection limits will be provided based on the variability of replicates at the lower end of the concentration scale.

A4.3 Accuracy

BAS uses standard reference materials whenever available as a check on the accuracy of each analytical run. Many of these are certified reference materials obtained from the U.S. EPA, the National Bureau of Standards, or the National Research Council. BAS is also developing its own low-level standards. Internal reference standards have been established for a variety of water parameters, including nitrite, nitrate, total phosphorus, chromium and copper.

Tables A8 and A9 present the results for analyzing standard reference materials for both sediment and water. When available, control limits, based on our historic data, are also included in the table to demonstrate that accuracy was under control during analysis of Algoma samples. Examples of control charts with warning limits set at ± two standard deviations and control limits set at ± three standard deviations are presented in the figures following.

A4.4 Recovery Checks

In methods where digestion and extractions are required, recovery checks or spikes are used to estimate the efficiency of the analysis. The percent recovery is estimated as:

$$\% \text{ Recovery} = \frac{\text{Measured Value}}{\text{Theoretical Value}}$$

In inorganic analyses, recoveries of less than 85% and greater than 115% are deemed unacceptable and appropriate corrective action is taken. In organic analyses, spiking is

TABLE A7: DETECTION LIMITS FOR SELECTED ALGOMA PARAMETERS BASED ON SIGNAL TO NOISE RATIO AND EPA's MDL's

Parameter	Matrix[1]	Signal: Noise	MDL
Conductivity	W	1.0 umhos/cm	0.265
NO_3	W	0.02 mg/L	0.011
NH_4	W	0.005 mg/L	0.0135
TP	W	0.002 mg/L	0.0014
Cyanide	W	0.002 mg/L	0.064
TKN	W	0.05 mg/L	0.194
DOC	W	0.5 mg/L	0.114
Be (DCP)	W	10 ug/L	5.4
Co (DCP)	W	10 ug/L	8.6
Mo (DCP)	W	20 ug/L	4.8
V (DCP)	W	10 ug/L	4.7
As	W S	1 ug/L 0.5 ug/g	2.46
Cu	W S	5 ug/L 1 ug/g	6.4
Pb (GF)	W S	0.5 ug/L 1 ug/g	1.09
Zn (DCP)	W S	5 ug/L 1 ug/g	10.2
Hg	W S	0.02 ug/L 0.02 ug/g	0.0565
Cd (GF)	W S	0.1 ug/L 0.05 ug/g	0.0578
Ni (DCP)	W S	10 ug/L 1 ug/g	5.6

TABLE A7: DETECTION LIMITS FOR SELECTED ALGOMA PARAMETERS BASED ON SIGNAL TO NOISE RATIO AND EPA's MDL's

Parameter	Matrix[1]	Signal: Noise	MDL
Cr (DCP)	W	10 ug/L	8.7
	S	1 ug/g	
Al (DCP)	W	20 ug/L	16
	S	5 ug/g	
Se	W	0.1 ug/L	0.96
	S	0.5 ug/g	-

[1] W = water; S = sediments.

used extensively for calibration and as a check on accuracy. Both samples and blanks are spiked with surrogate standards, compounds very close in structure to the analytes themselves.

A4.4.1 Results of Surrogate Spiking - Organic Analyses

Results of the surrogate spikes for analyses of phenol species by Novalab Ltd. are presented in Tables A10. Of the six water samples analyzed for these parameters, four had only barely detectable levels of phenols or none at all. Recoveries of the surrogate standards, D_5-phenol and trifluoromethyl-m-cresol in both samples and blanks were greater than 90%. Two samples, however, A1-2 and B-1 had relatively high levels of phenols and poor recoveries of the surrogate standards in both the samples and blanks. In order to detect any nitrophenols which might be present in these samples, the two samples were rerun without acetylation. Detectable levels of nitrophenols, however, were not observed either with or without acetylation. The low recoveries of the surrogate standards, especially the trifluoromethyl-m-cresol, are not easily explained. The similar levels of cresol (M, P and O) in both acetylated and unacetylated samples, despite largely different recoveries of the cresol surrogate in A1-2 (17.9 and 54.9%, respectively), suggest a spiking problem during the analyses. A similar explanation may explain the poor recoveries of the surrogates in the blanks run with acetylation. In many respects, these two samples, A1-2 and B-1, were highly unusual. VOC concentrations in these samples were greater than 82,000 and 10,000 ug/L, respectively, and PAH levels were also very high. Sample A1-2 had a conductivity greater than 7,000 uS/cm and contained abnormally high levels of sulphate (4,700 mg/L), iron (620 mg/L) and magnesium (620 mg/L). It is likely the matrices of these samples were significantly different from the other samples.

Results of surrogate spikes for PAH analyses are presented in Table A10. Recoveries obtained are typical for these organic analyses. Insufficient historic data exist at BAS for calculation of specific control limits for surrogate recoveries in PAH analysis.

Logical Data Checks

Analytical data at BAS are checked routinely for internal consistency. One of the common verifications of logical consistency is the calculation of an anion-cation balance

TABLE A10: SURROGATE RECOVERIES FOR ANALYSIS OF PHENOLIC SPECIES

Sample	Surrogate Standard	% Recovery (Sample)	% Recovery (Blank)
A1-2	D5 phenol	9.2/15.2[1]	40/96.3[1]
	trifluoromethyl-M-cresol	54.9/17.9[1]	71.5/100[1]
B-1	D5 phenol	64.3/77.1[1]	40/96.3[1]
	trifluoromethyl-M-cresol	83/78[1]	71.5/100[1]
SPA2	D5 phenol	94.6	96.3
	trifluoromethyl-M-cresol	97	100
SP-P77	D5 phenol	92.1	96.3
	trifluoromethyl-M-cresol	97	100
C_4	D5 phenol	100	100
	trifluoromethyl-M-cresol	100	100
SW1	D5 phenol	92.5	100
	trifluoromethyl-M-cresol	94.8	100

[1] Samples run without acetylation.

TABLE A11: SURROGATE RECOVERIES FOR ANALYSIS OF PAHs

Sample	Surrogate Standard	% Recovery (sample)
A1-25.5	d_8 Naphthalene	-
	d_{10} Phenanthrene	90.4
	d_{12} Benzo(a)pyrene	101
	d_{12} Benzo(g,h,i)peryline	62
C_4-15	d_8 Naphthalene	-
	d_{10} Phenanthrene	91.5
	d_{12} Benzo(a)pyrene	116.9
	d_{12} Benzo(g,h,i)peryline	63.4
$A_2$19	d_8 Naphthalene	75.5
	d_{10} Phenanthrene	89.9
	d_{12} Benzo(a)pyrene	113.6
	d_{12} Benzo(g,h,i)peryline	60.2
RS-1	d_8 Naphthalene	-
	d_{10} Phenanthrene	76.7
	d_{12} Benzo(a)pyrene	159.1
	d_{12} Benzo(g,h,i)peryline	88.3
RS-11	d_8 Naphthalene	79.5
	d_{10} Phenanthrene	89.8
	d_{12} Benzo(a)pyrene	115.0
	d_{12} Benzo(g,h,i)peryline	70.5
RS-10	d_8 Naphthalene	101.7
	d_{10} Phenanthrene	89.6
	d_{12} Benzo(a)pyrene	154.8
	d_{12} Benzo(g,h,i)peryline	67.4
RS-9	d_8 Naphthalene	78.7
	d_{10} Phenanthrene	92.7
	d_{12} Benzo(a)pyrene	96.1
	d_{12} Benzo(g,h,i)peryline	66.2
RS-2	d_8 Naphthalene	80.1
	d_{10} Phenanthrene	89.3
	d_{12} Benzo(a)pyrene	109.7
	d_{12} Benzo(g,h,i)peryline	68.1
D_3-21	d_8 Naphthalene	86.9
	d_{10} Phenanthrene	91.9
	d_{12} Benzo(a)pyrene	88.2
	d_{12} Benzo(g,h,i)peryline	64.1

TABLE A11: SURROGATE RECOVERIES FOR ANALYSIS OF PAHs

Sample	Surrogate Standard	% Recovery (sample)
SW_2	d_8 Naphthalene	83.8
	d_{10} Phenanthrene	88.8
	d_{12} Benzo(a)pyrene	99.3
	d_{12} Benzo(g,h,i)peryline	67.4
SW-1	d_8 Naphthalene	-
	d_{10} Phenanthrene	87.2
	d_{12} Benzo(a)pyrene	-
	d_{12} Benzo(g,h,i)peryline	60.0
SW-5	d_8 Naphthalene	-
	d_{10} Phenanthrene	94.2
	d_{12} Benzo(a)pyrene	120.1
	d_{12} Benzo(g,h,i)peryline	70.1

SELECTED CONTROL CHARTS FOR
STANDARD REFERENCE MATERIALS ANALYZED
WITH ALGOMA-STELCO SAMPLES

on the analytical results to determine the deviation of the sample from theoretical electroneutrality. Following methods outlined in Environment Canada (1979), anion-cation balances were calculated for all aqueous samples having a sufficient number of analyses on which to perform the calculation. The results (Table A11) are expressed in percent deviation from electroneutrality. A rating of 5% or less is considered acceptable. Only two samples, A1-2 and B1 were found to fall outside this limit. A1-2, which deviated by 8.6%, was extremely high in conductivity (greater than 7,000 uS/cm). At this conductivity, the relationships used to calculate the ionic balances cannot be assumed to apply. The deviation of 28% in sample B-1 cannot be easily explained. However, as discussed above, both these samples were highly unusual both in inorganic and organic analyses.

A4.5 Corrective Action for a System Out-of-Control

In applying control charts, loss of control is indicated by five successive points on the same side of the average line or a point beyond the control limit. If such a situation occurs for a particular analysis, subsequent analyses are halted until the system is checked and determined to be in-control again. Results are not released to clients unless the system has been declared in control by the quality control officer.

A4.6 Performance Evaluation Audits

BEAK has participated and continues to participate in a large number of external audits. The audits involve the analysis of check standards or interlaboratory comparisons of samples conducted by various government agencies. The results of these external audits are available on request. In addition, BEAK is certified for doing work under EPA regulations in New York (Certificate No. 10823). This certification requires BAS to undergo routine proficiency testing and laboratory inspection. BEAK also acts as a private contract laboratory to the Ontario Ministry of the Environment in the Ministry's Inland Lakes Program. This program involves extensive quality control checks of the data produced by Beak Analytical Services.

The following is a summary of the External Performance audits in which we have participated:

Environment Canada Canada Centre for Inland Waters Burlington, Ontario	The National Interlaboratory Quality Control Program Continued participation since 1975. Studies 14, 15, 16, 18, 19, 20, 21, 23, 25, 27, 28, 29, 30, 33, 35, DQC-2, DQC-3, LRTAP9, 10, 11, 12, 15, 16, 17, 18, 19, QM3, 4, 5, 9, 11 and 12.
Environment Canada Fisheries and Oceans Captine Bernier Laboratories Longeuil, Quebec	Project Analytical Cross-Check Program Interlaboratory comparison of mercury, cadmium, copper, lead, selenium and zinc in fish tissue in 1977. Interlaboratory comparison of cadmium, mercury, lead and PCBs in sediment and biological material in 1980.
Environment Canada Environmental Protection Service Bedford Institute of Oceanography	Project Analytical Cross-Check Program Interlaboratory comparison of mercury, cadmium, copper and PCBs in sediment and biological material in 1980. Quality control check for PCBs, chlorobenzenes and PAHs in standards and spiked sediment.
Ontario Ministry of the Environment Environmental Laboratory Services Branch Toronto, Ontario	Leachate Analysis Comparative Study, 1985 Interlaboratory comparison of five industrial waste samples using the MOE Leachate Procedure (LP) for recovery of Cd, Cu, Cr, Mn, Ni, Pb and Zn.
National Research Council of Canada Ottawa, Ontario	Marine Analytical Chemistry Standard Program First Intercomparison Exercise for Trace Metals in Marine Sediments - NRC MS1/TM Calibration for Cu, Zn, Cd, Hg and Pb in 1984.
Energy, Mines and Resources Earth Sciences Geological Survey of Canada Ottawa, Ontario	Canadian Certified Reference Materials Project, 1984 Collaborative testing of four stream sediments for Hg, Cd, Cu, Cr, Fe, Ni, Pb and Zn.
Eldorado Nuclear Ltd. Warman, Saskatchewan 1977	Environmental assessment of proposed uranium refinery at Warman, Saskatchewan, involved detailed studies of air quality, aquatic, terrestrial and socio-economic aspects. BEAK conducted an extensive hydrogeological investigation program resulting in a novel approach to radioactive waste management.

A5 References

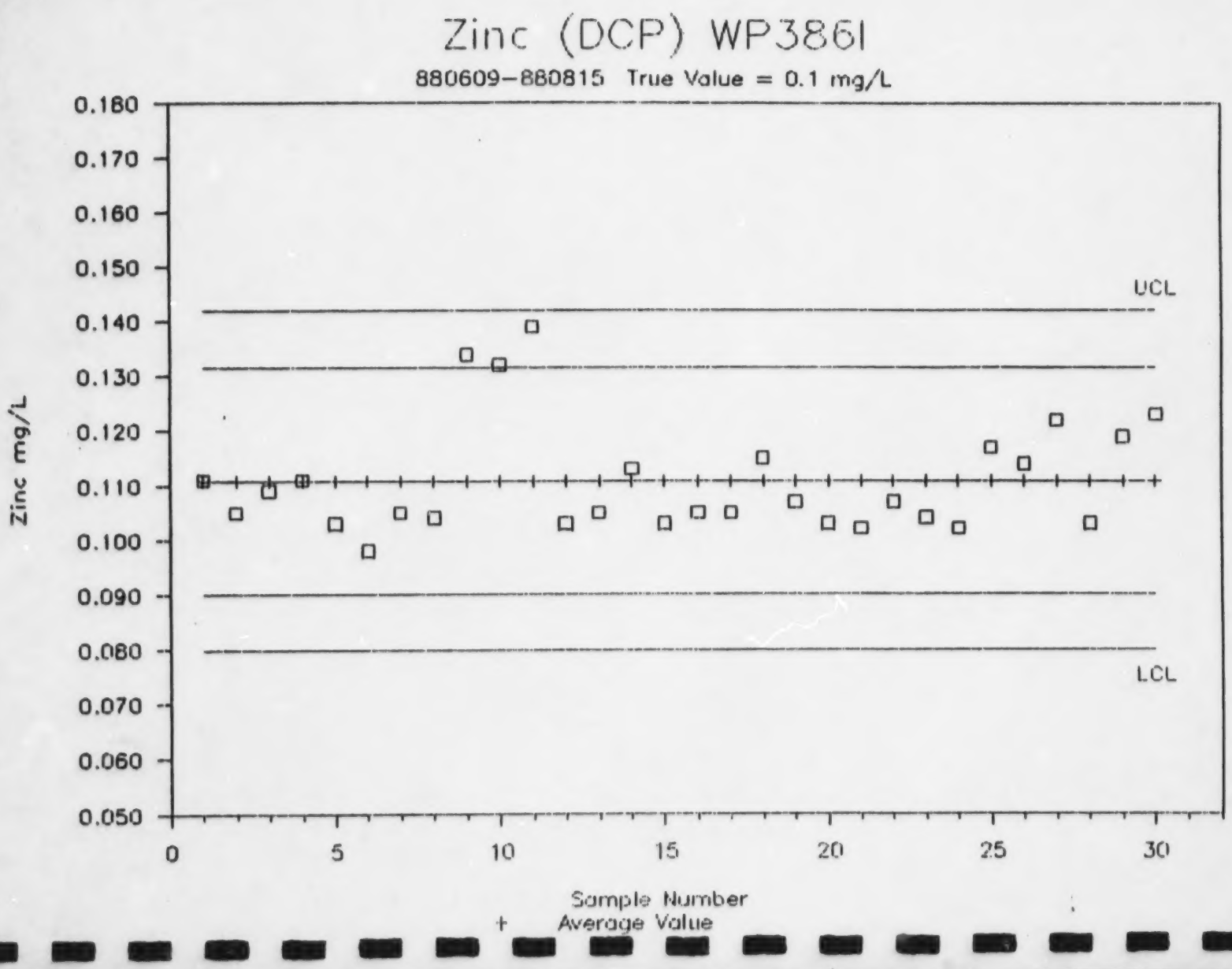
ASTM. 1985. ASTM Standards on Precision and Bias for Various Applications. ASTM, Philadelphia, PA. 256 p.

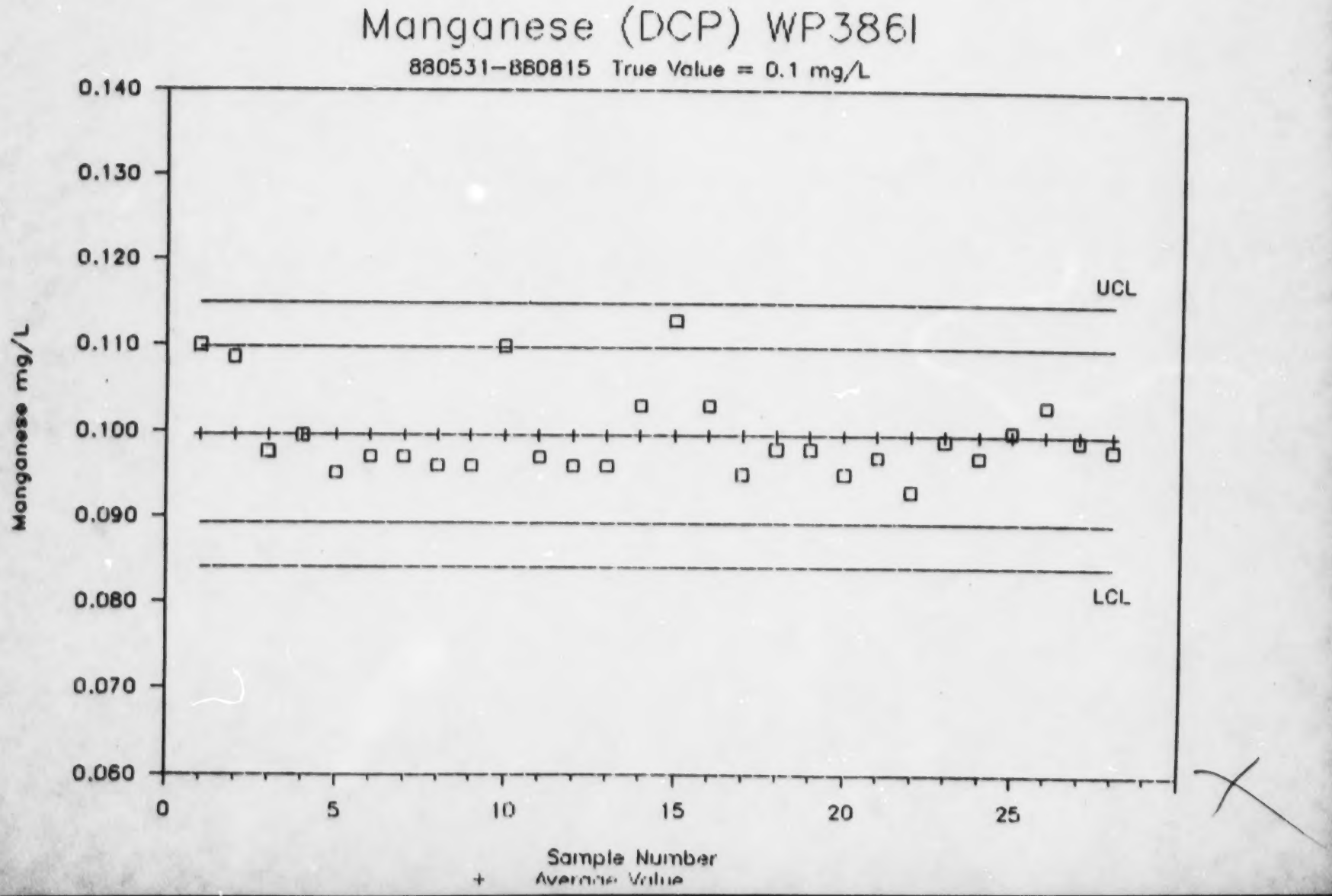
Environment Canada. 1979. Analytical Methods Manual.

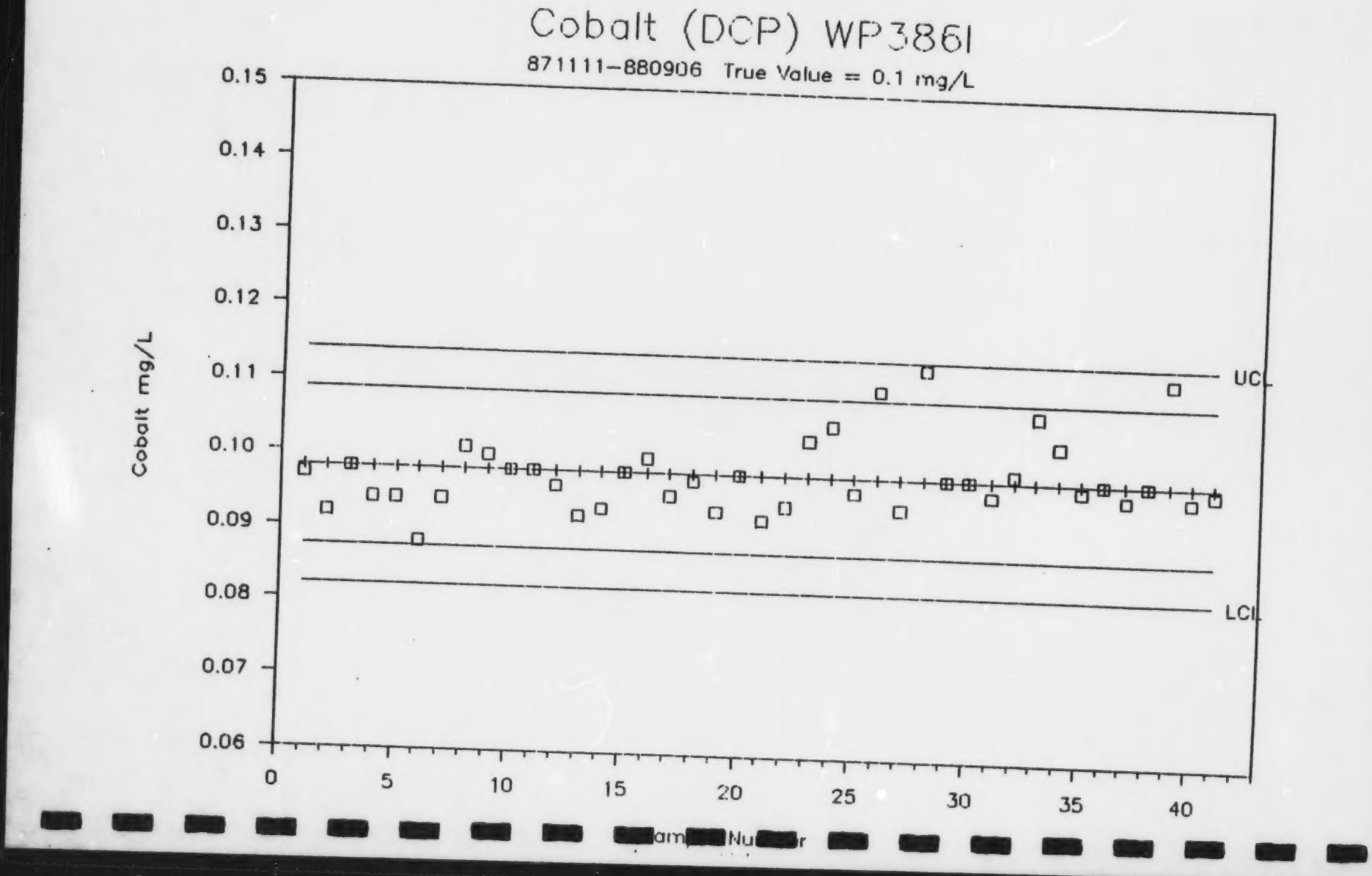
HAMES. 1983. Handbook of Analytical Methods for Environmental Samples. Ontario Ministry of the Environment.

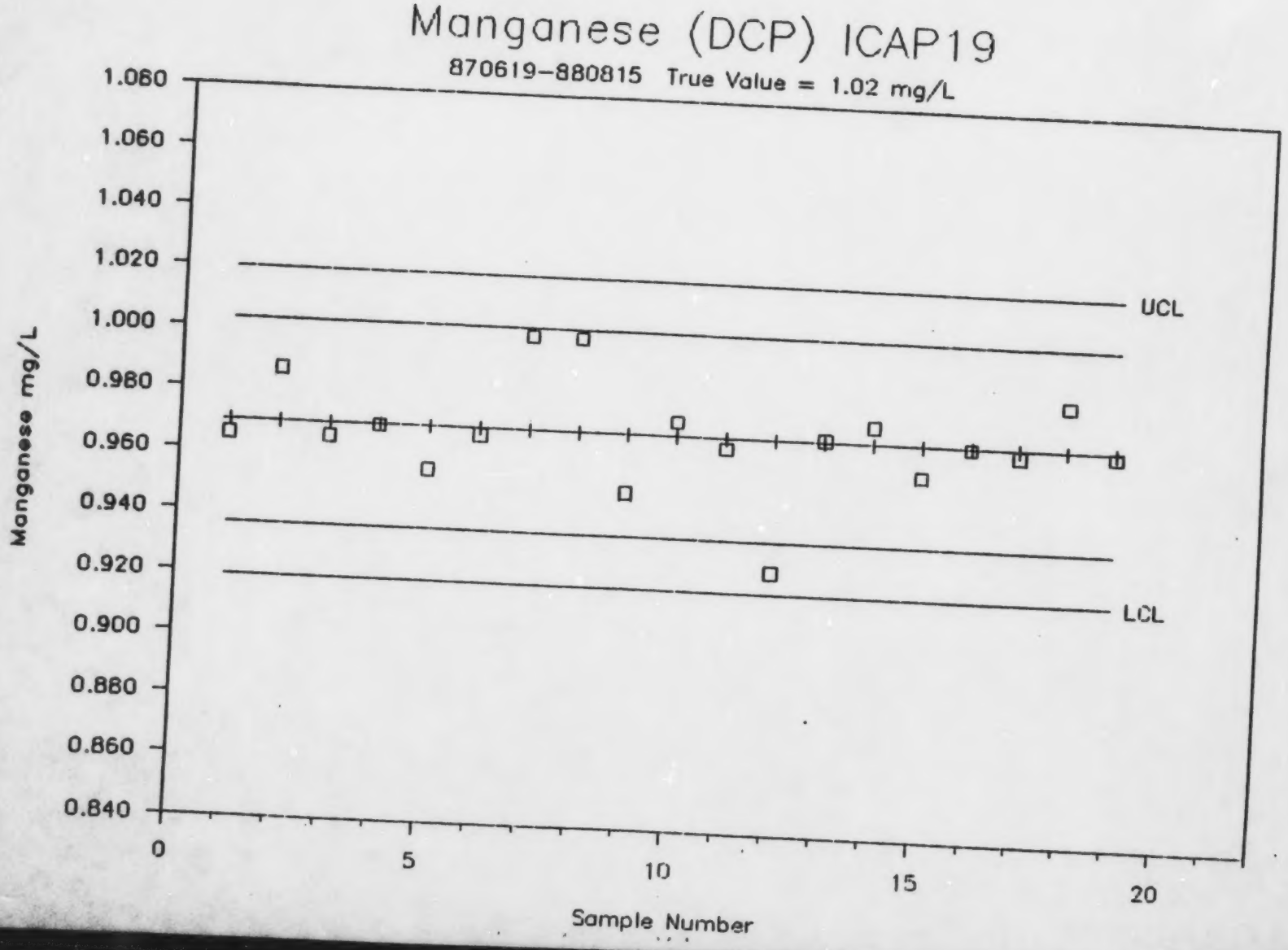
Ontario Ministry of the Environment (MOE). 1976. Quality Control and Data Evaluation Procedures. Laboratory Services Branch, Data Quality Report Series Appendix.

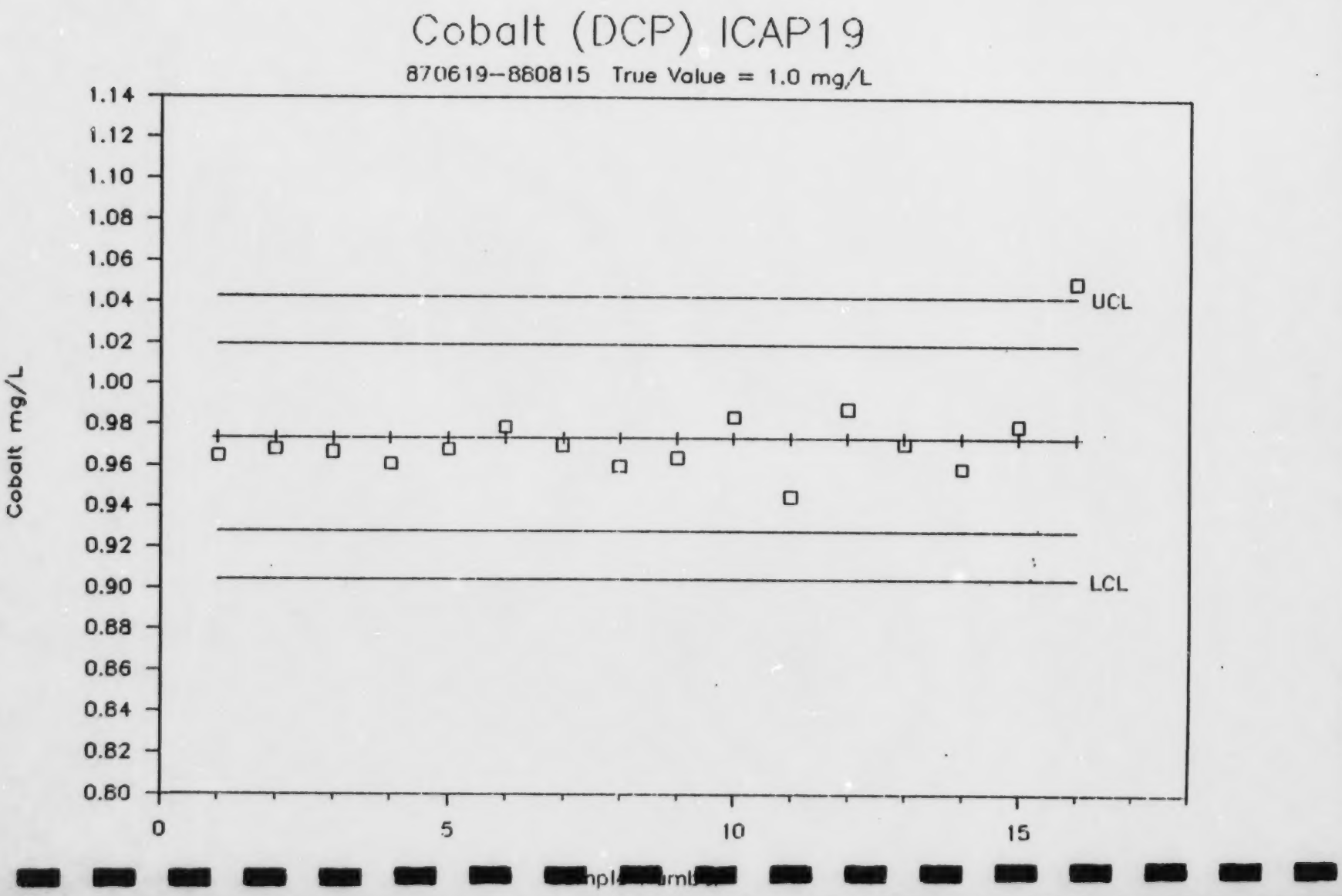
U.S. Environmental Protection Agency (EPA). 1979. Handbook for Analytical Quality Control in Water and Wastewater Laboratories. EPA-600/4-79-019.

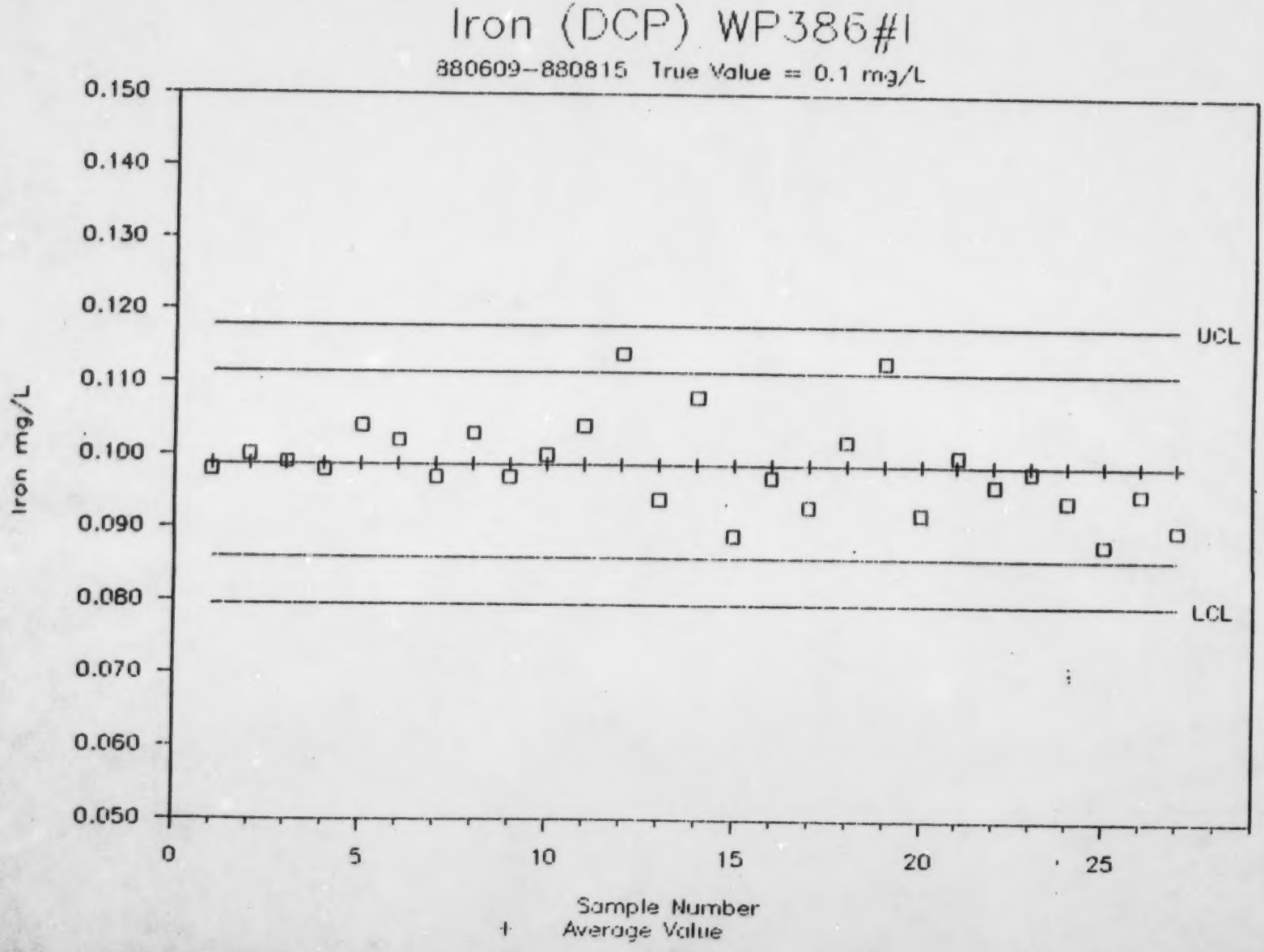

Zinc (DCP) WP3861
880609-880815 True Value = 0.1 mg/L
0.180
0.170
0.160
0.150
0.140
0.130
0.120
0.110
0.100
0.090
0.080
0.070
0.060
0.050
Zinc mg/L
UCL
LCL
0
5
10
15
20
25
30
Sample Number
+ Average Value

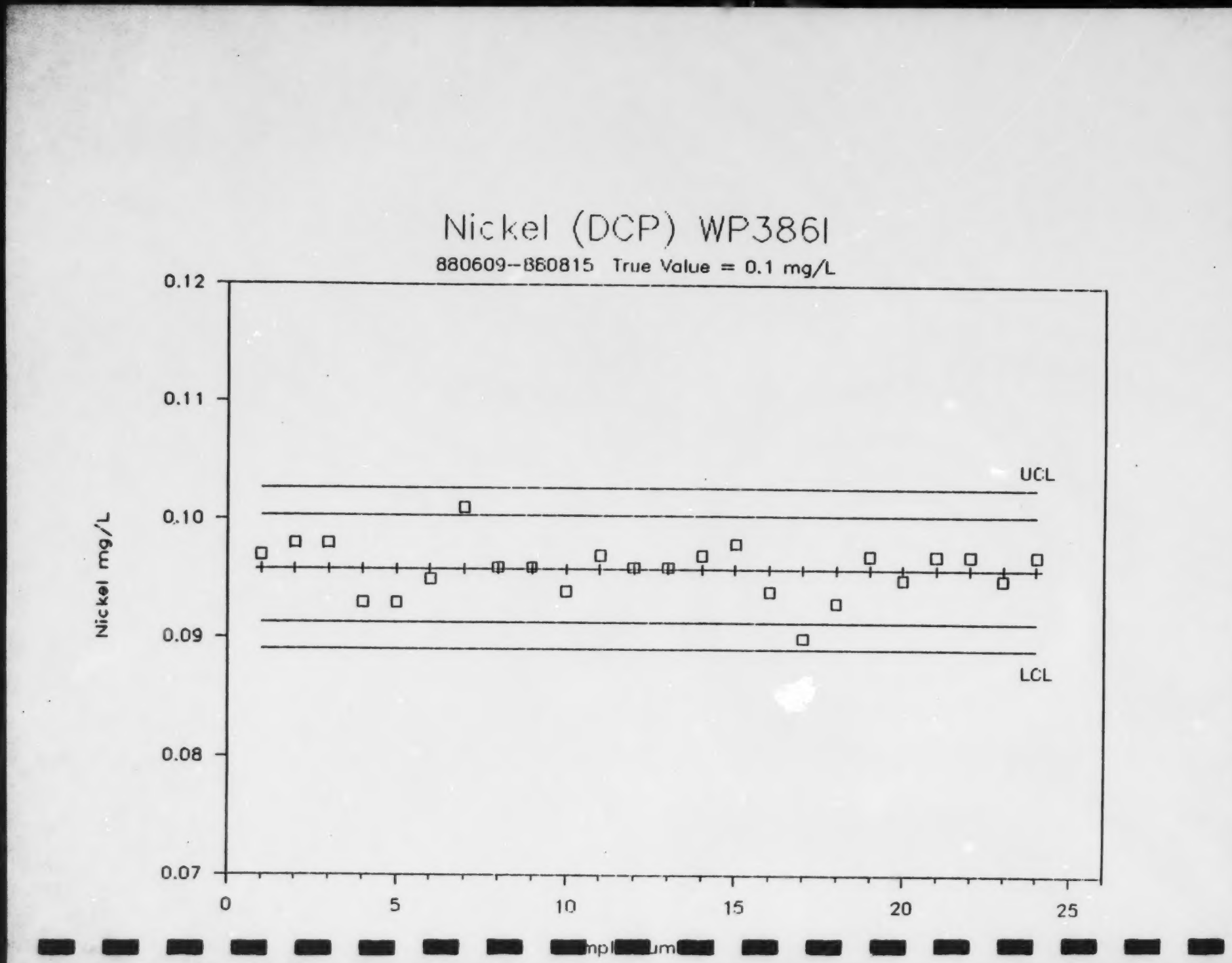

Manganese (DCP) WP3861
880531-880815 True Value = 0.1 mg/L
0.140
0.130
0.120
0.110
0.100
0.090
0.080
0.070
0.060
Manganese mg/L
UCL
LCL
0
5
10
15
20
25
Sample Number
+ Average Value

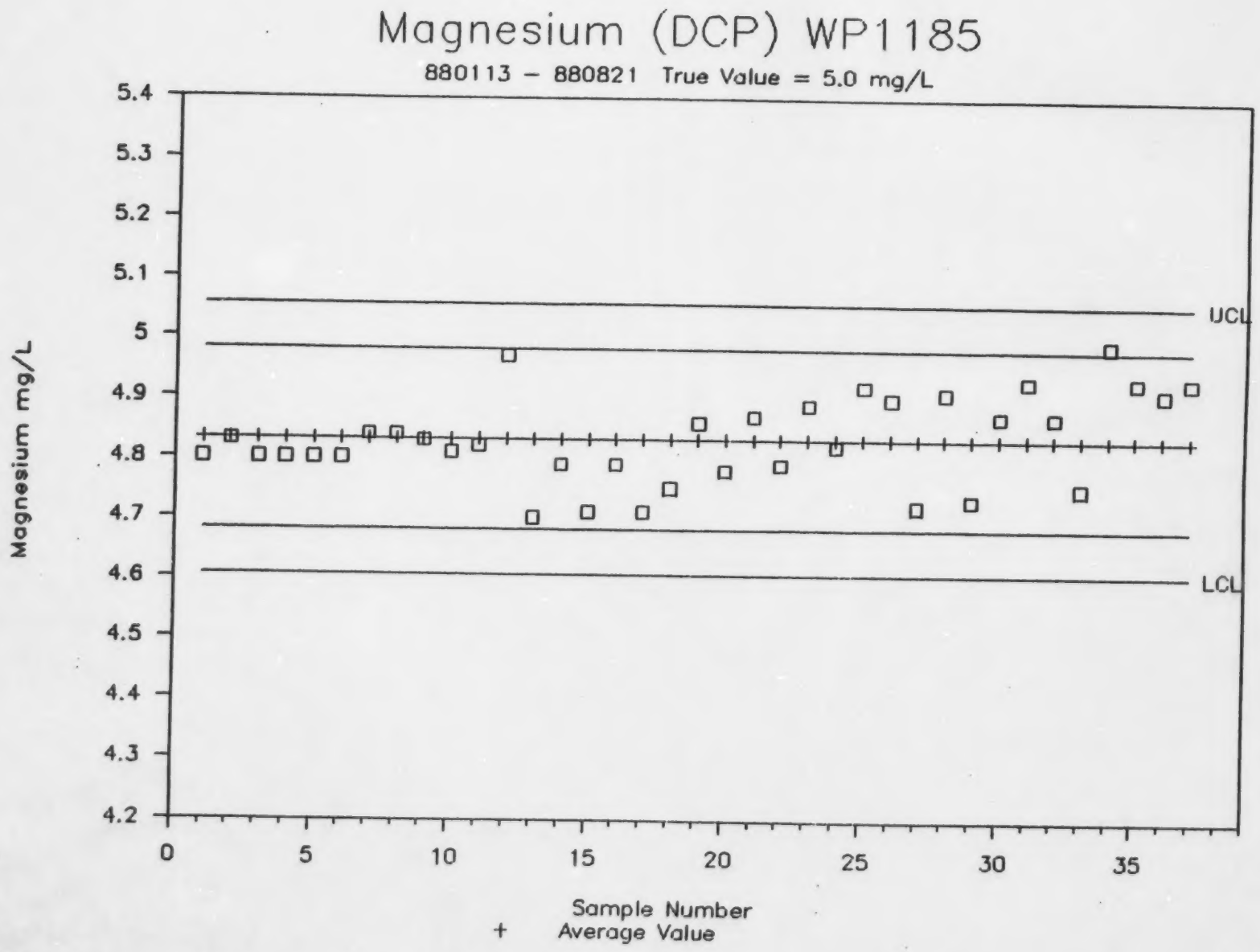

Cobalt (DCP) WP3861
871111-880906 True Value = 0.1 mg/L
Cobalt mg/L
0.15
0.14
0.13
0.12
0.11
0.10
0.09
0.08
0.07
0.06
UCL
LCL
0
5
10
15
20
25
30
35
40

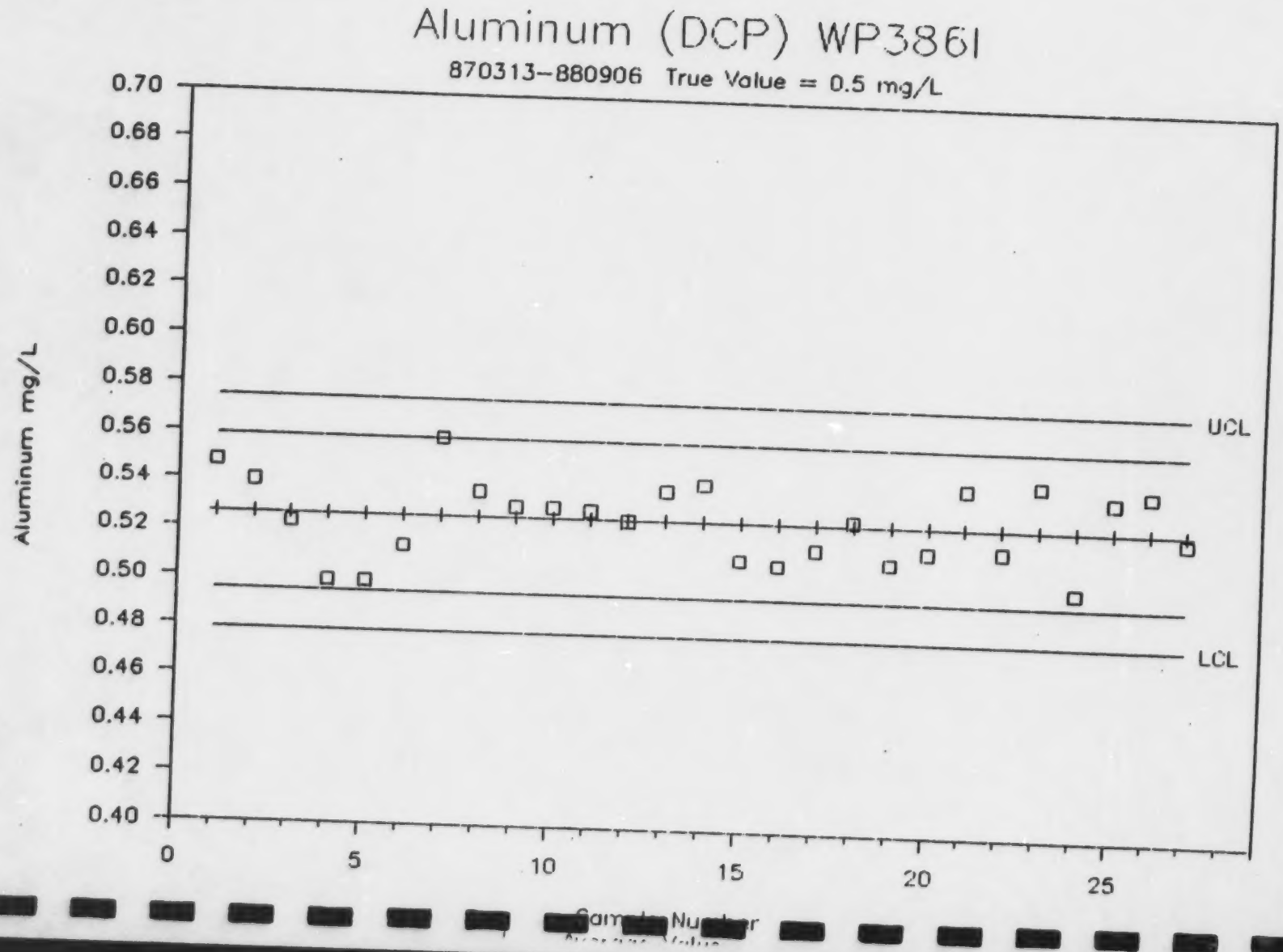

Manganese (DCP) ICAP19
870619-880815 True Value = 1.02 mg/L
1.080
1.060
1.040
1.020
1.000
0.980
0.960
0.940
0.920
0.900
0.880
0.860
0.840
Manganese mg/L
UCL
LCL
0
5
10
15
20
Sample Number

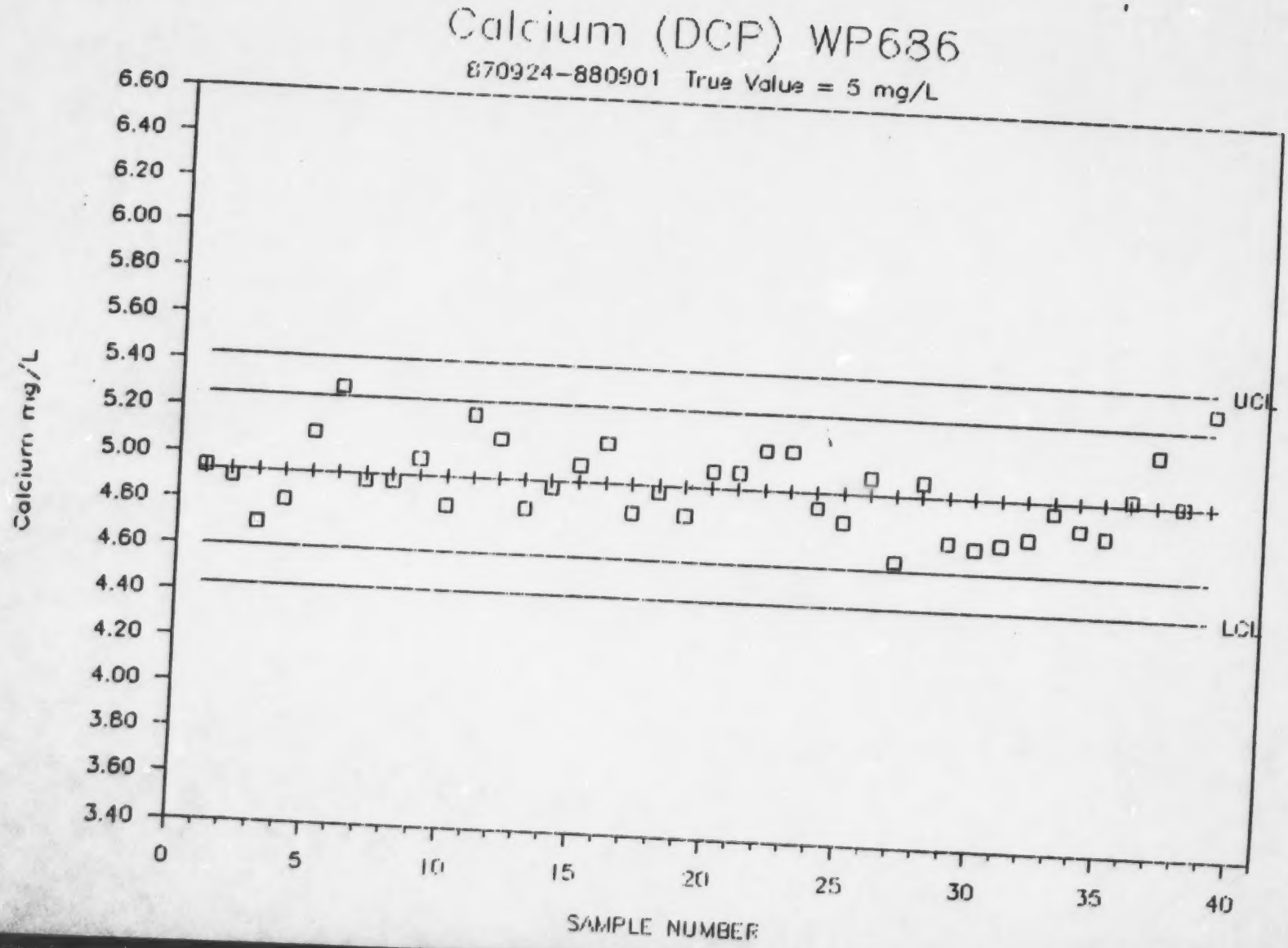

Cobalt (DCP) ICAP19
870619-880815 True Value = 1.0 mg/L
Cobalt mg/L
1.14
1.12
1.10
1.08
1.06
1.04
1.02
1.00
0.98
0.96
0.94
0.92
0.90
0.88
0.86
0.84
0.82
0.80
UCL
LCL
0
5
10
15

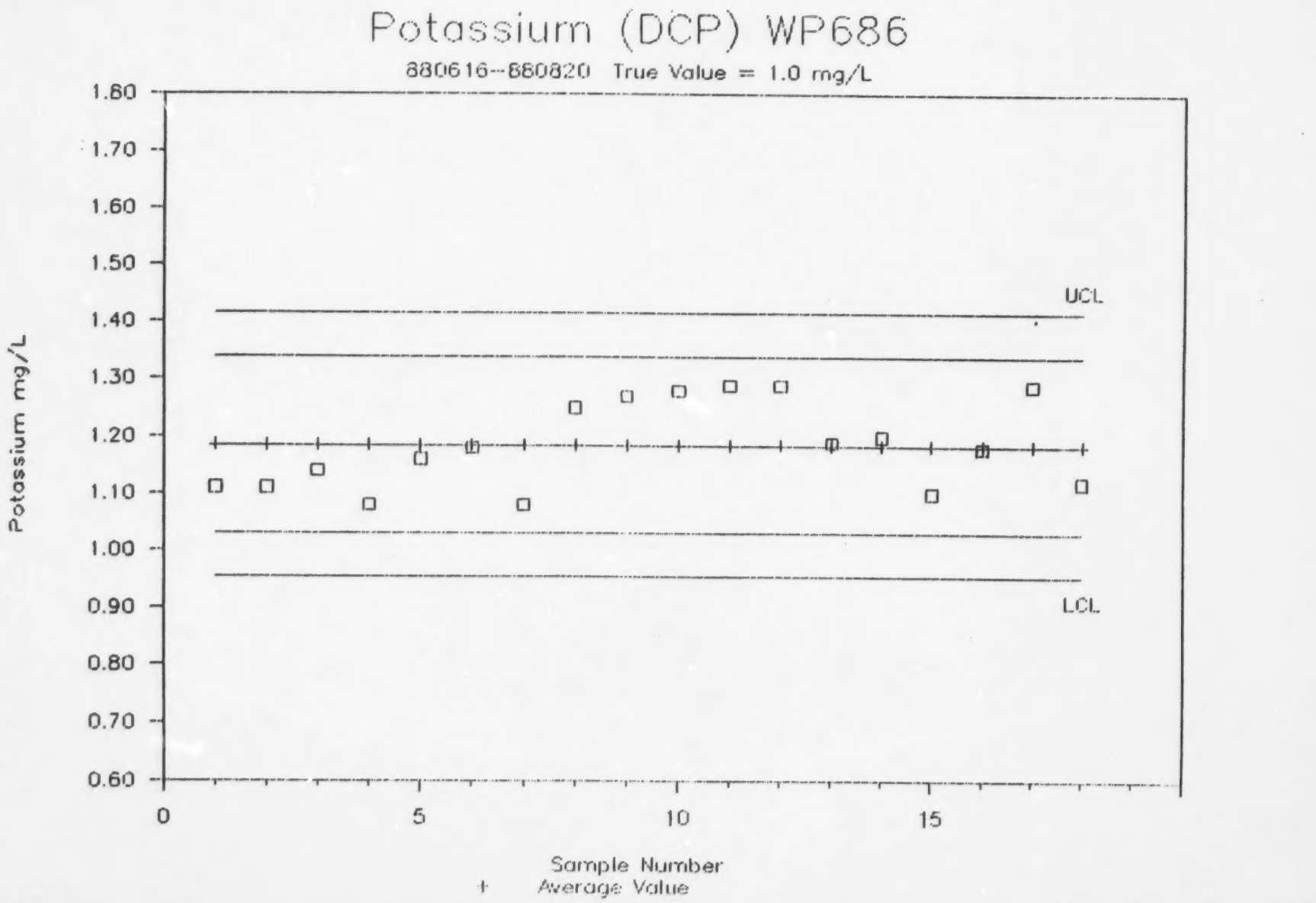

Iron (DCP) WP386#1
880609-880815 True Value = 0.1 mg/L
0.150
0.140
0.130
0.120
0.110
0.100
0.090
0.080
0.070
0.060
0.050
Iron mg/L
UCL
LCL
0
5
10
15
20
25
Sample Number
Average Value

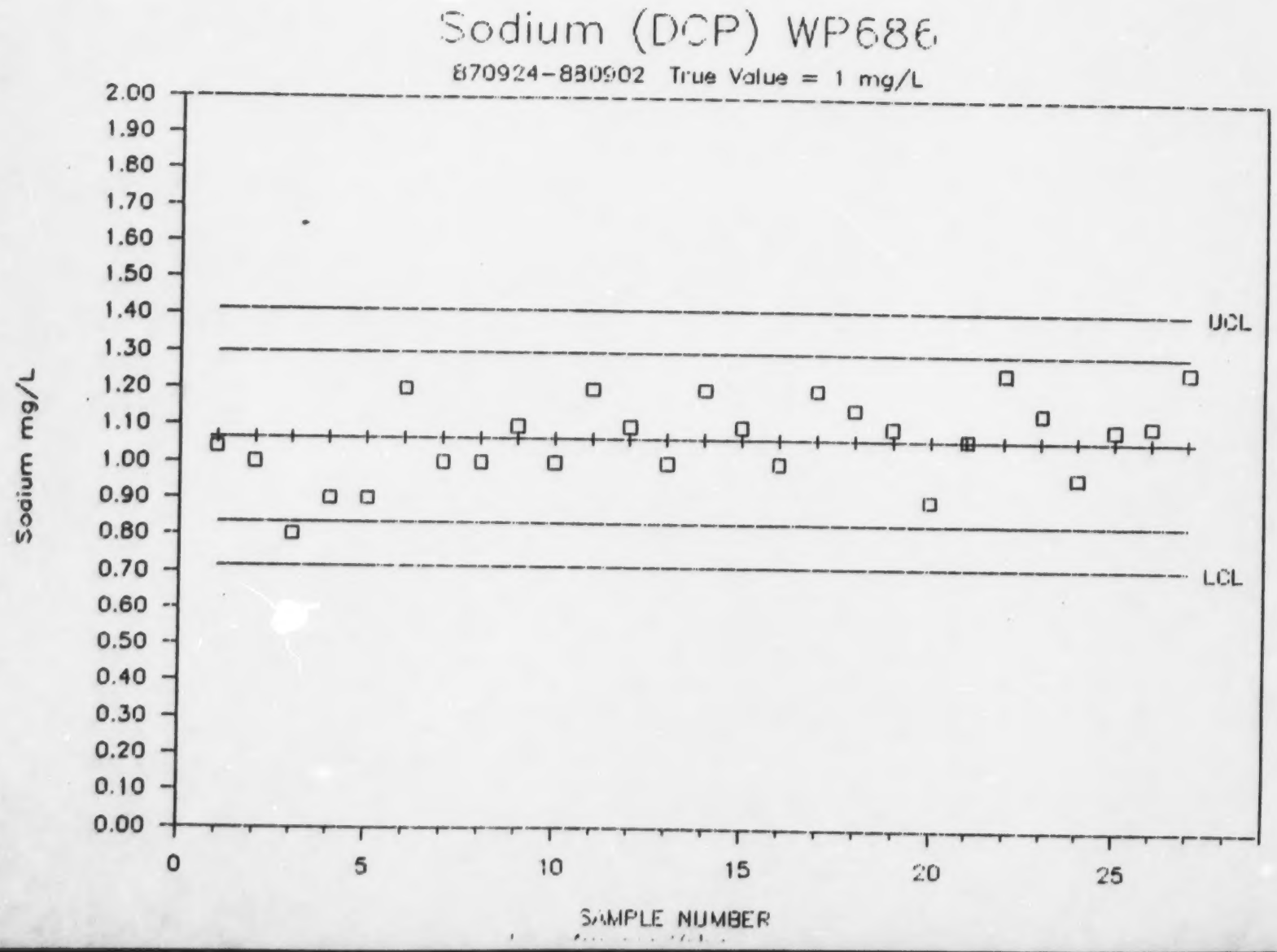

Nickel (DCP) WP3861
880609--880815 True Value = 0.1 mg/L
0.12
0.11
0.10
0.09
0.08
0.07
Nickel mg/L
UCL
LCL
0
5
10
15
20
25


Magnesium (DCP) WP1185
880113 – 880821 True Value = 5.0 mg/L
Magnesium mg/L
5.4
5.3
5.2
5.1
5
4.9
4.8
4.7
4.6
4.5
4.4
4.3
4.2
UCL
LCL
0
5
10
15
20
25
30
35
Sample Number
+ Average Value


Aluminum (DCP) WP3861
870313–880906 True Value = 0.5 mg/L
Aluminum mg/L
0.70
0.68
0.66
0.64
0.62
0.60
0.58
0.56
0.54
0.52
0.50
0.48
0.46
0.44
0.42
0.40
UCL
LCL
0
5
10
15
20
25

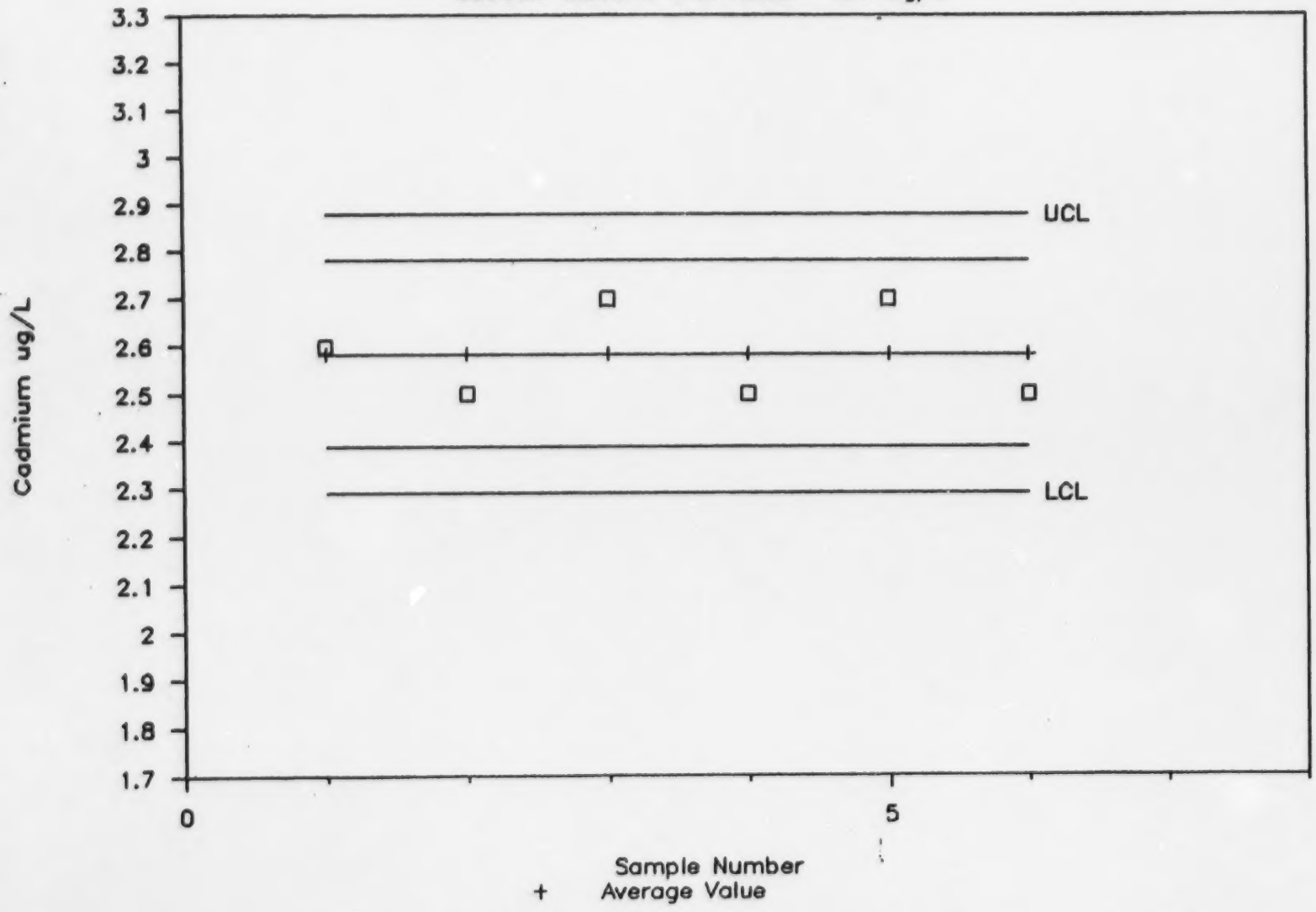

Calcium (DCP) WP636
870924-880901 True Value = 5 mg/L
Calcium mg/L
6.60
6.40
6.20
6.00
5.80
5.60
5.40
5.20
5.00
4.80
4.60
4.40
4.20
4.00
3.80
3.60
3.40
UCL
LCL
0
5
10
15
20
25
30
35
40
SAMPLE NUMBER

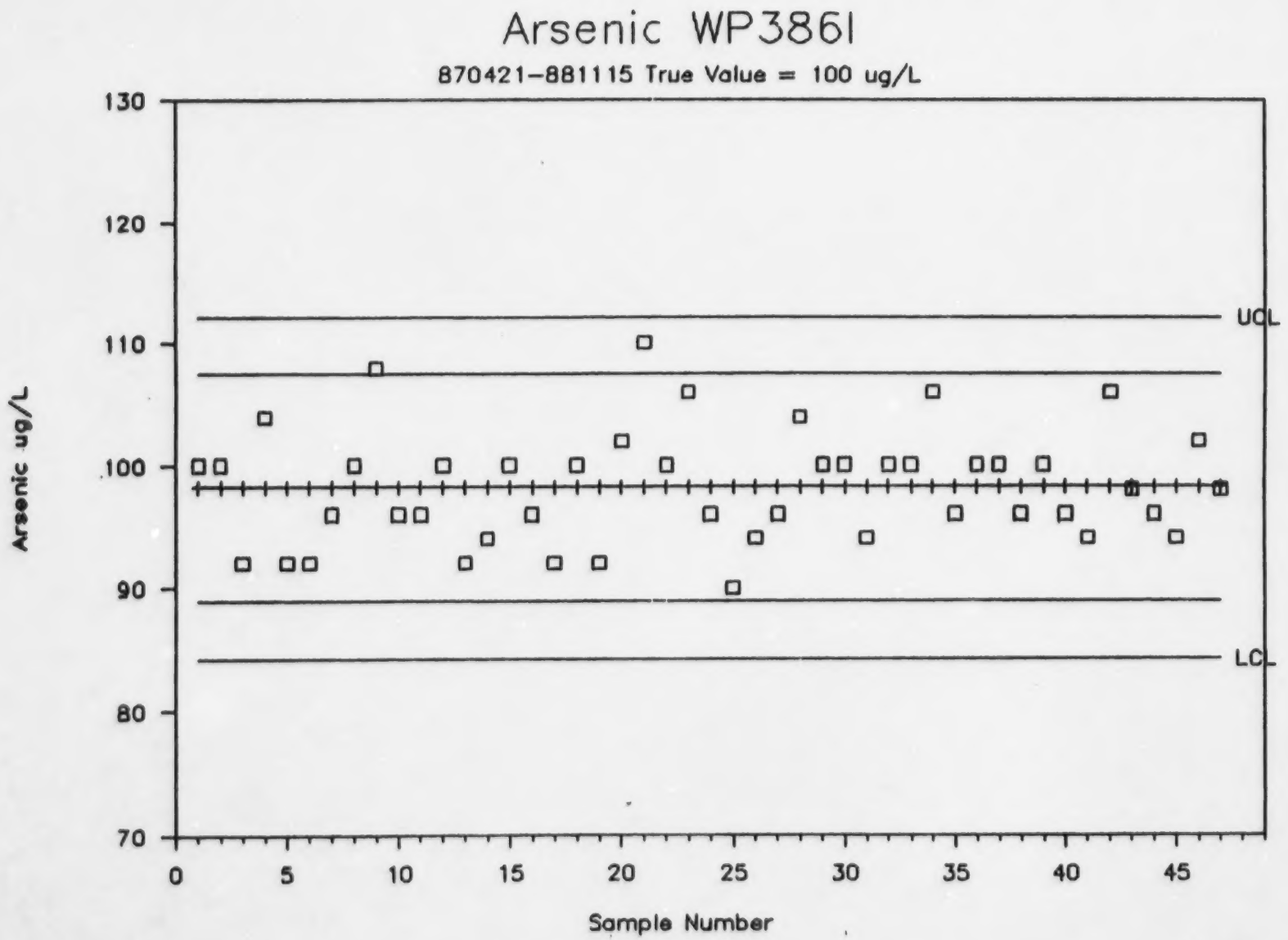

Potassium (DCP) WP686
880616--880820 True Value = 1.0 mg/L
1.80
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
Potassium mg/L
UCL
LCL
0
5
10
15
Sample Number
Average Value

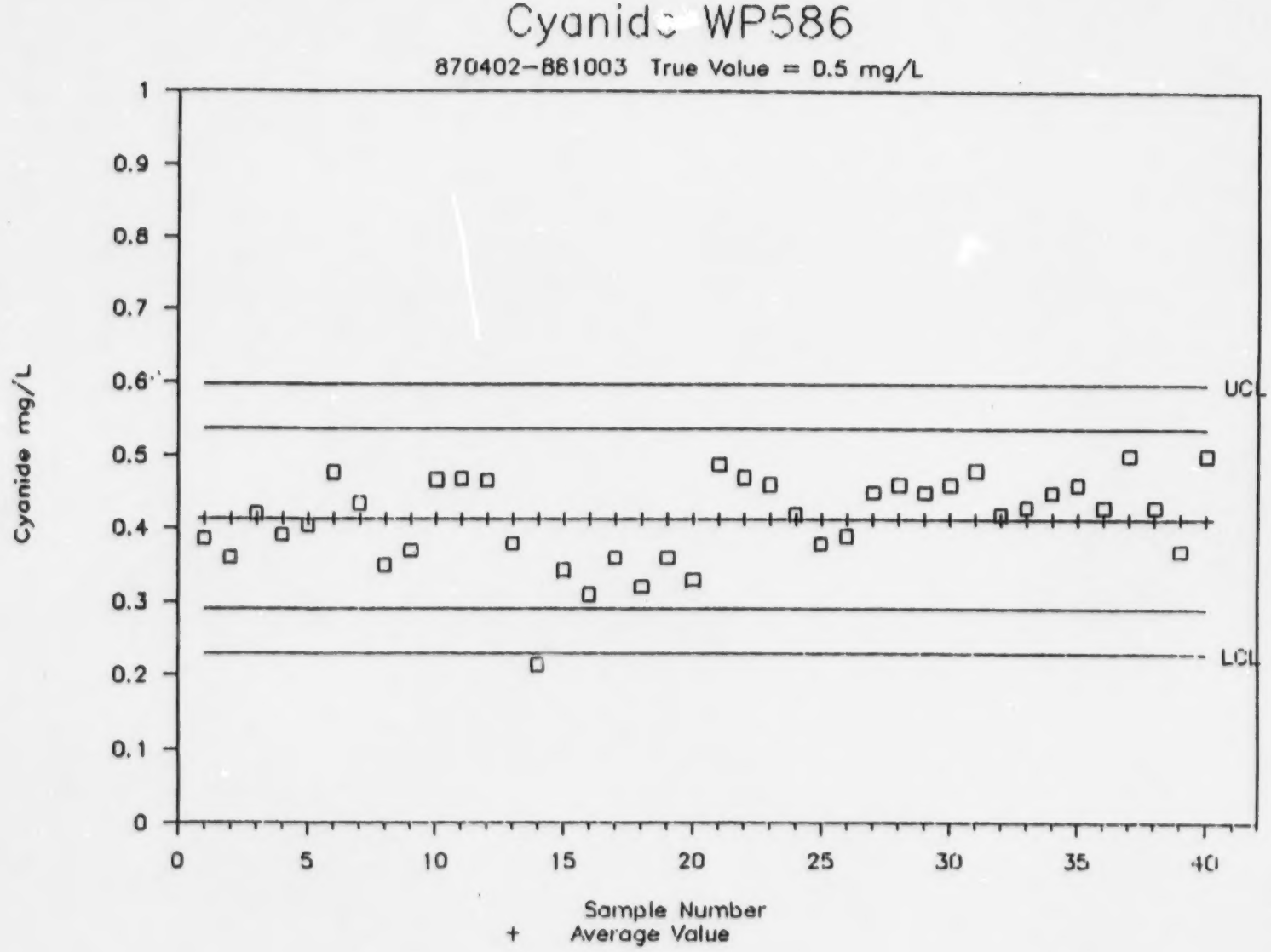

Sodium (DCP) WP686
870924-880902 True Value = 1 mg/L
Sodium mg/L
2.00
1.90
1.80
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
UCL
LCL
0
5
10
15
20
25
SAMPLE NUMBER

Cadmium (GFAAS) WS378#4

880606-880616 True Value = 2.7 ug/L

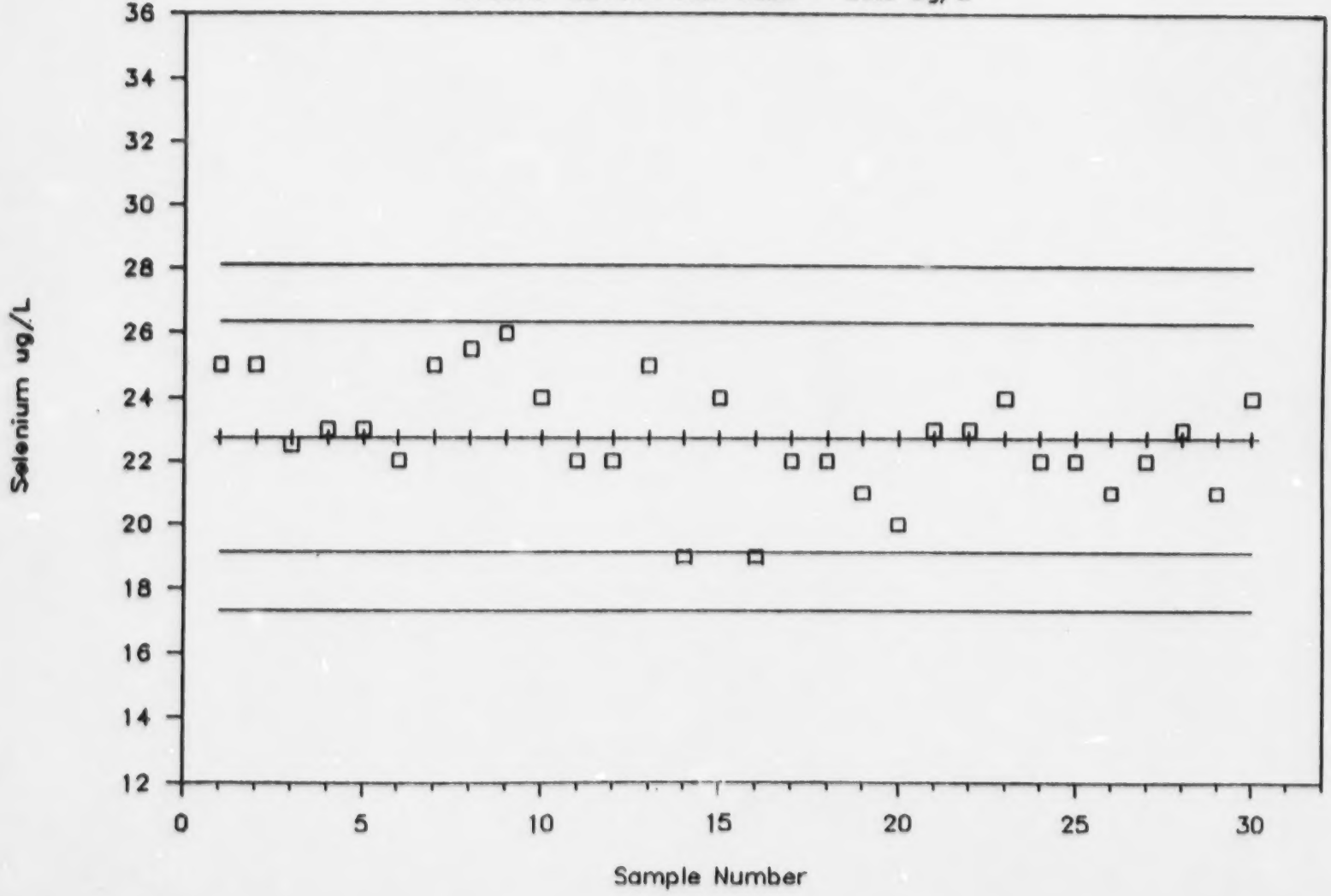



Arsenic WP3861
870421-881115 True Value = 100 ug/L
130
120
110
100
90
80
70
UCL
LCL
Arsenic ug/L
0
5
10
15
20
25
30
35
40
45
Sample Number


Cyanide WP586
870402-881003 True Value = 0.5 mg/L
Cyanide mg/L
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
UCL
LCL
0
5
10
15
20
25
30
35
40
Sample Number
+ Average Value

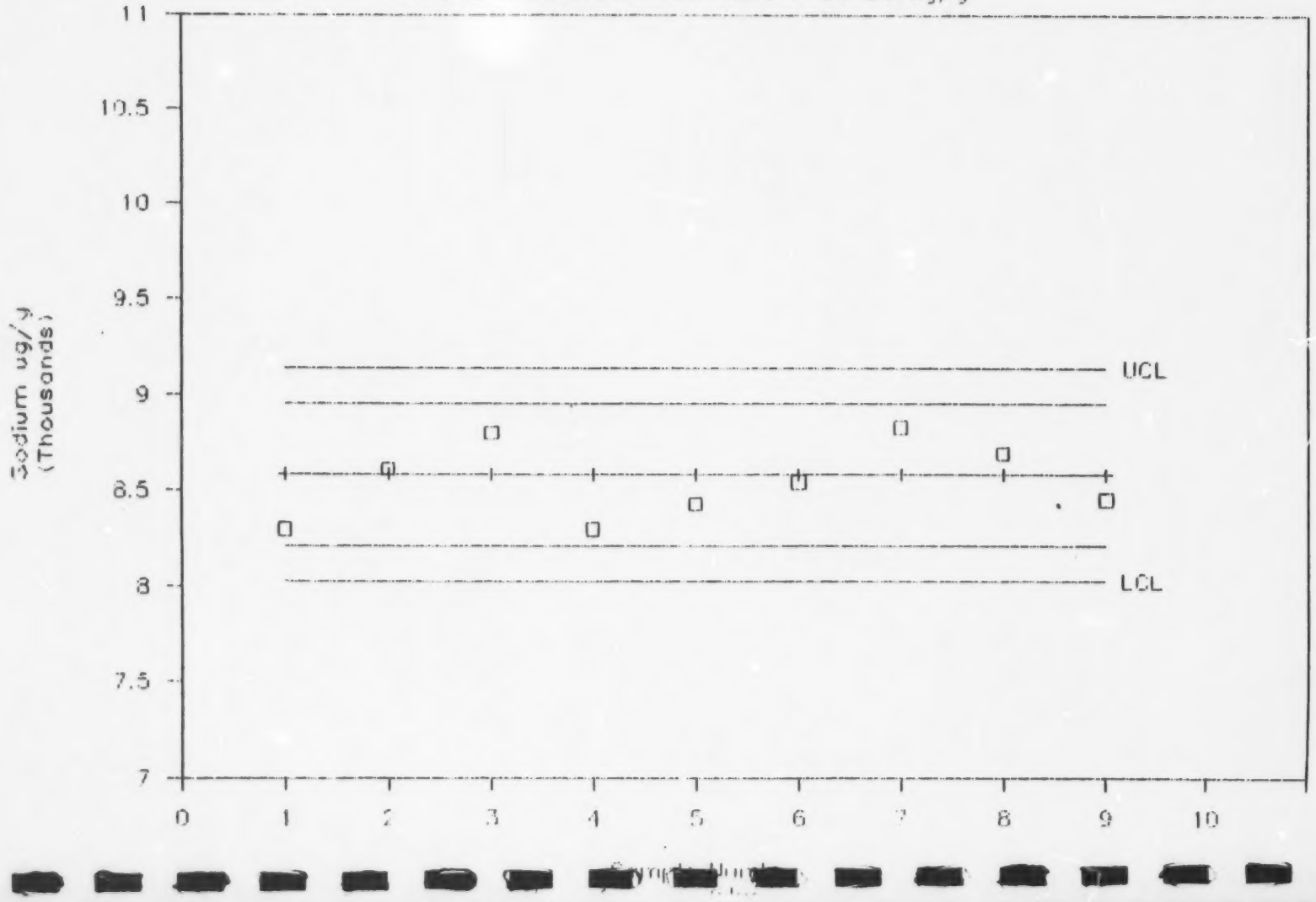
Selenium WP3861

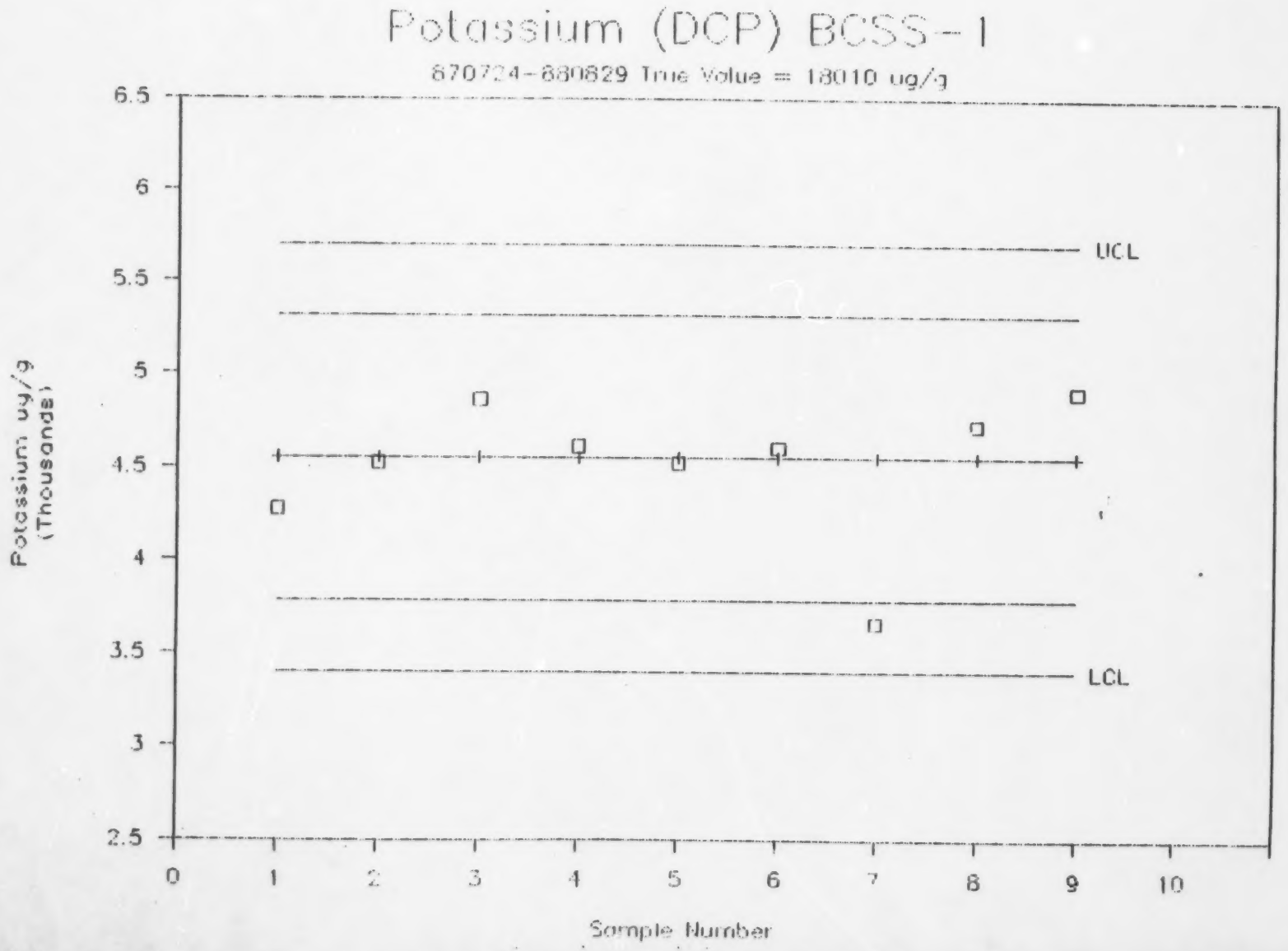
870015-881115 True Value = 25.0 ug/L

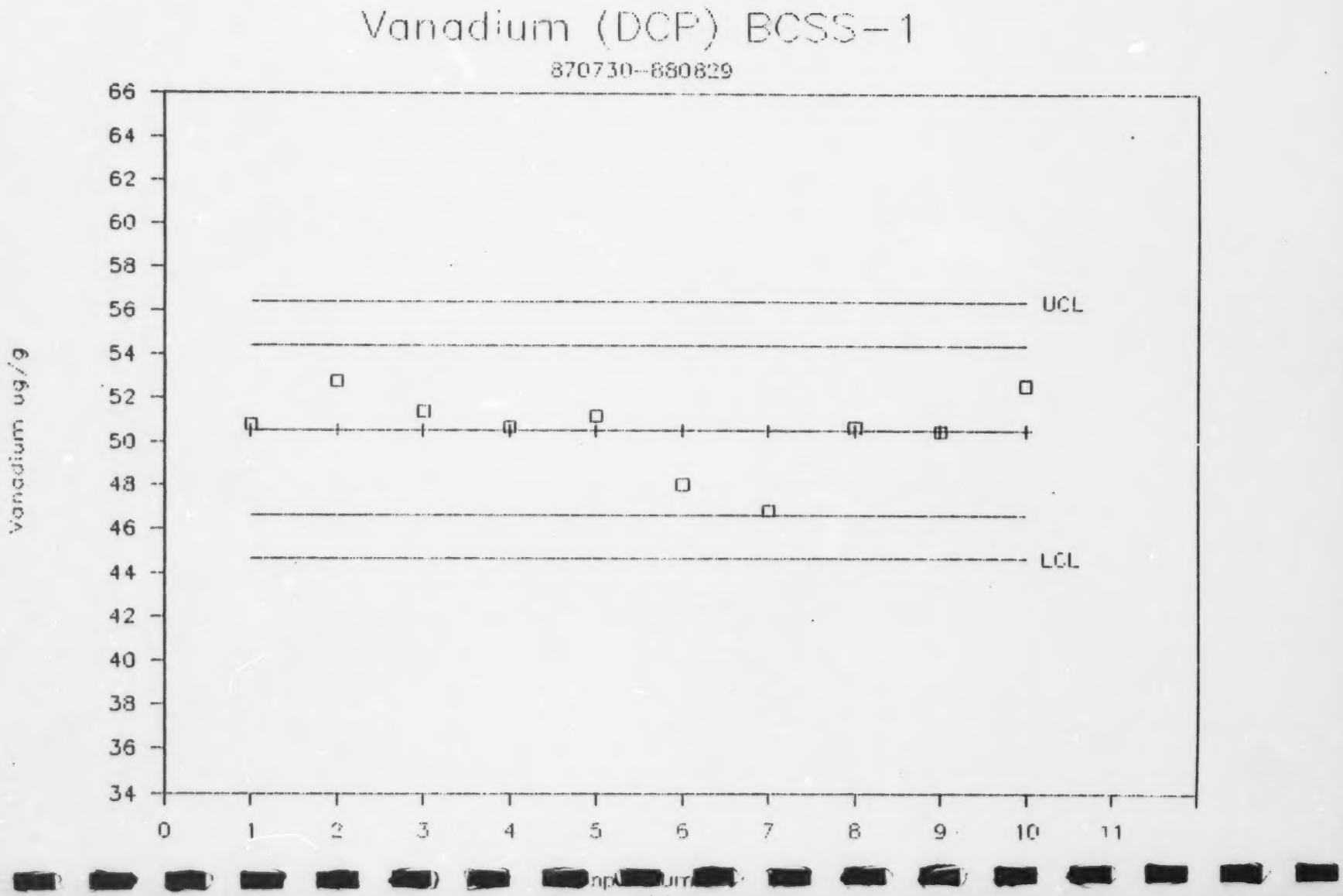


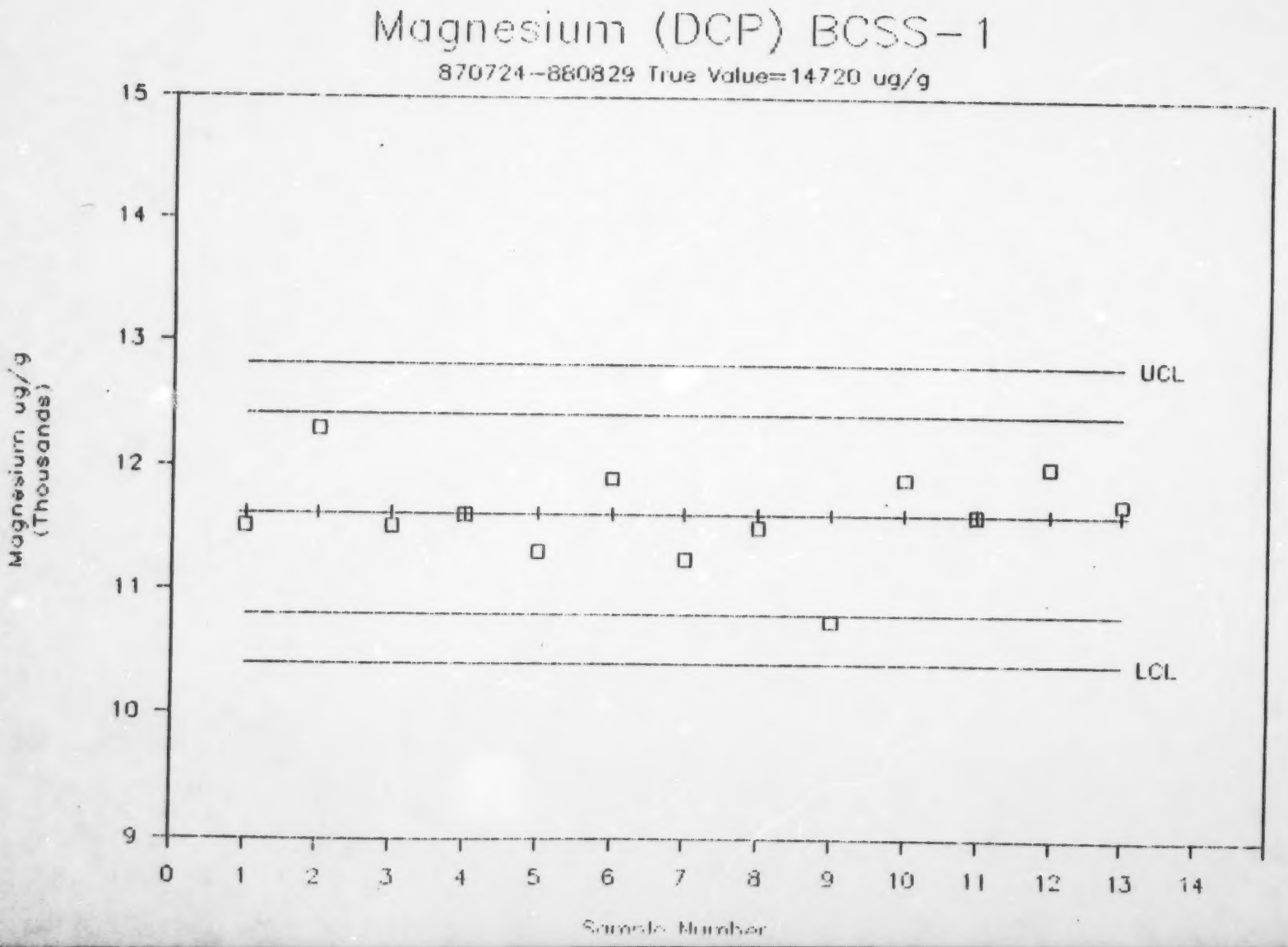
Sodium (DCP) BCSS-1

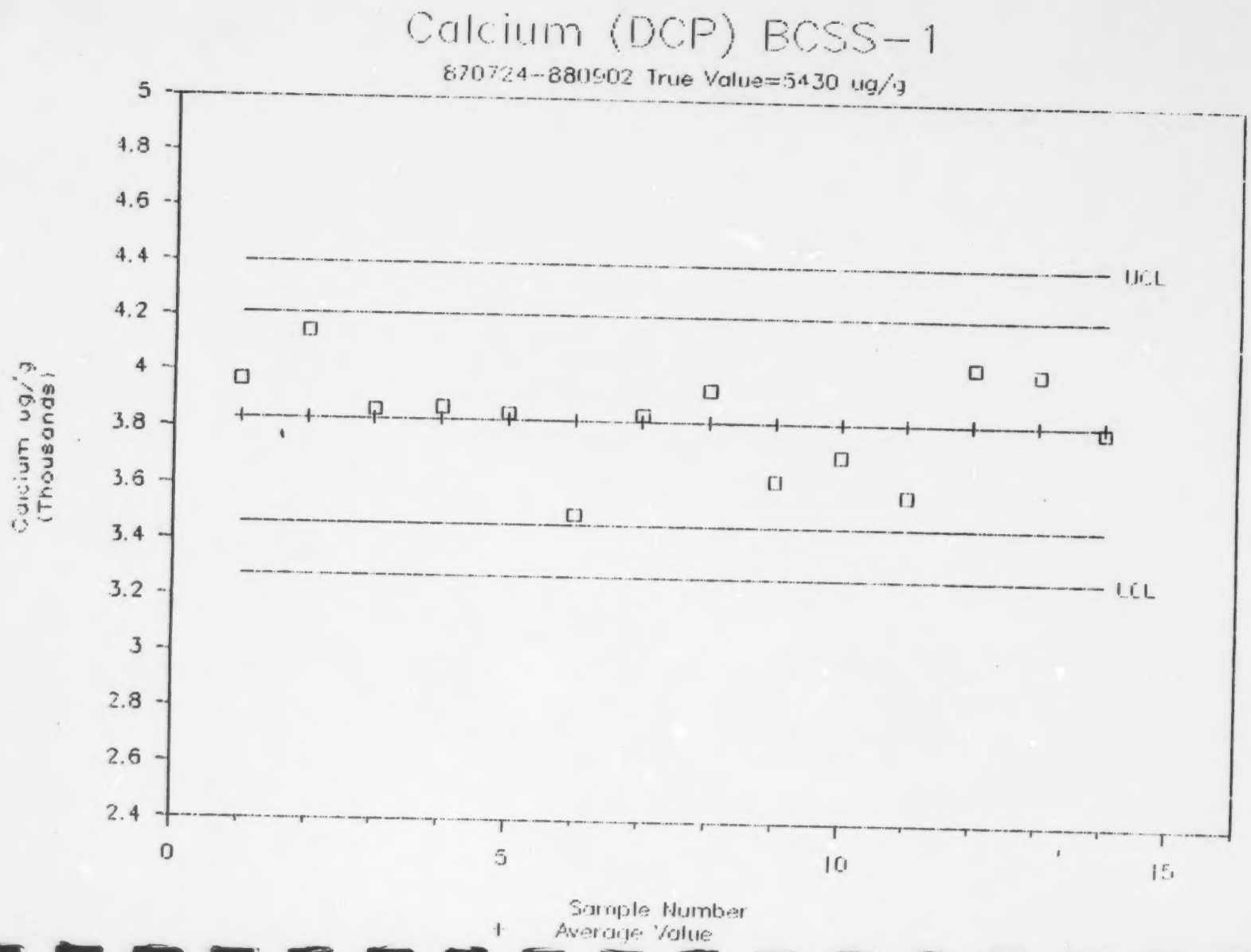
670724-880820 True Value = 20180 ug/g

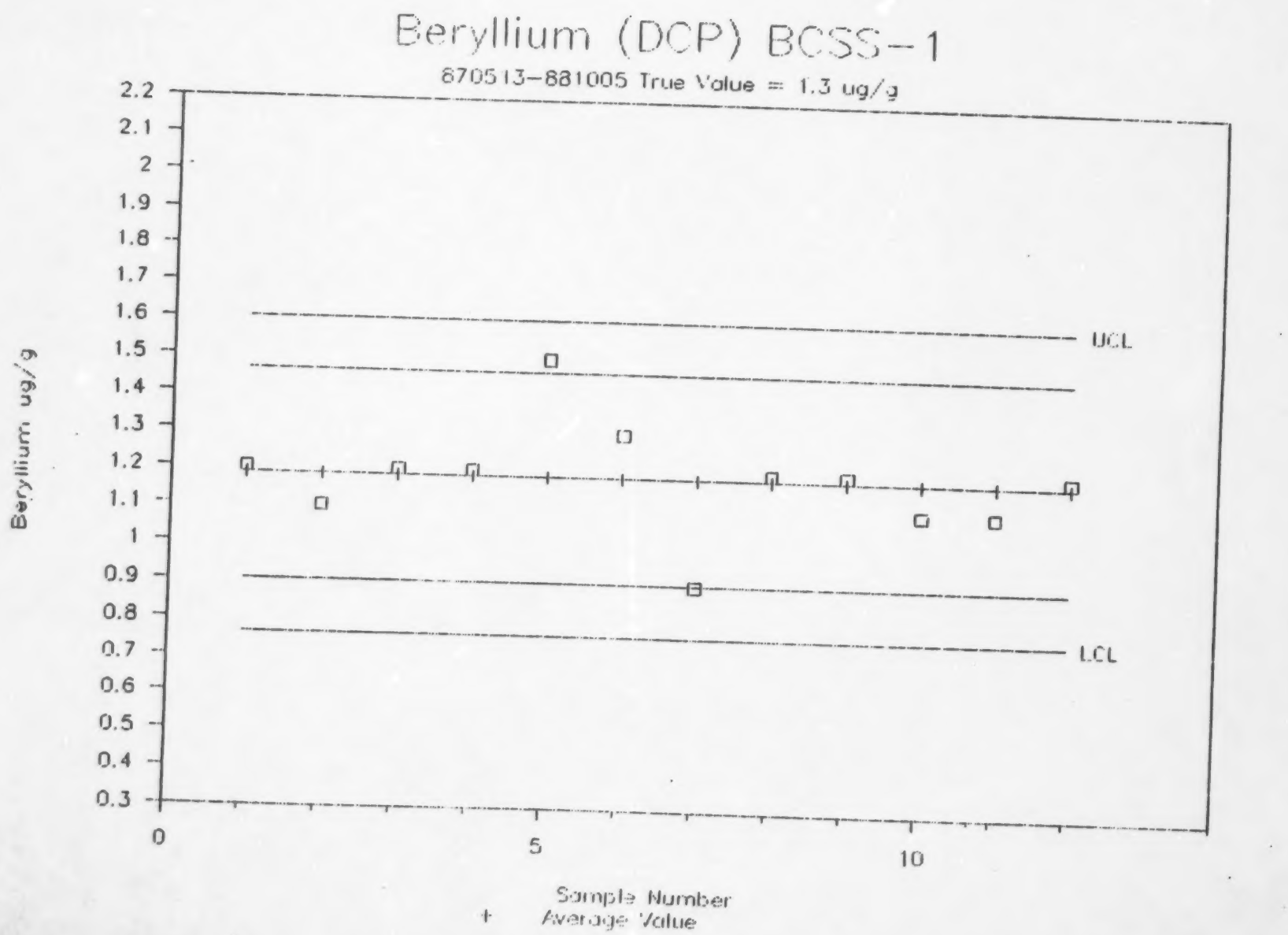


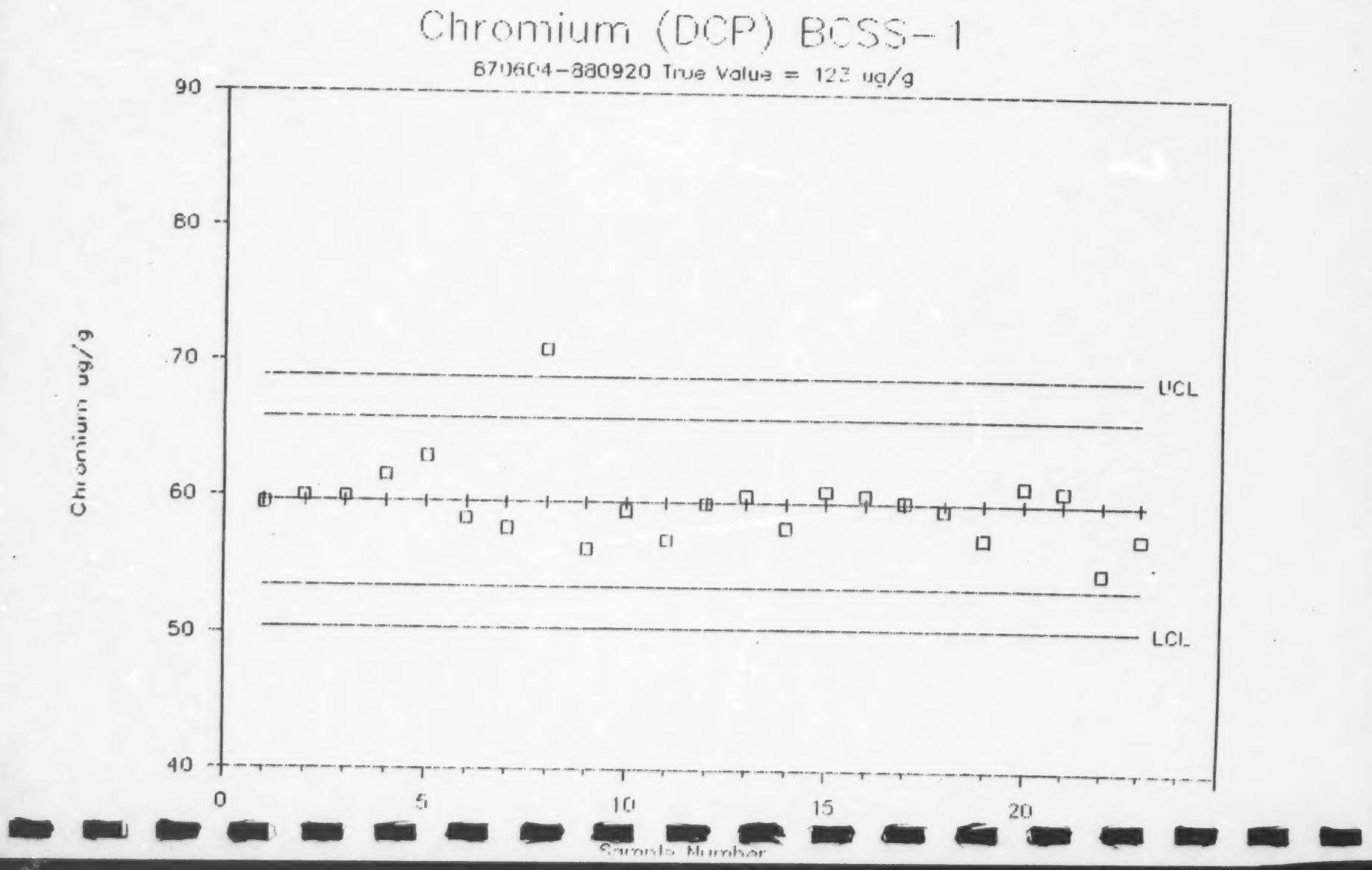

Potassium (DCP) BCSS-1
870724-880829 True Value = 18010 ug/g
6.5
6
5.5
5
4.5
4
3.5
3
2.5
UCL
LCL
Potassium ug/g
(Thousands)
0
1
2
3
4
5
6
7
8
9
10
Sample Number

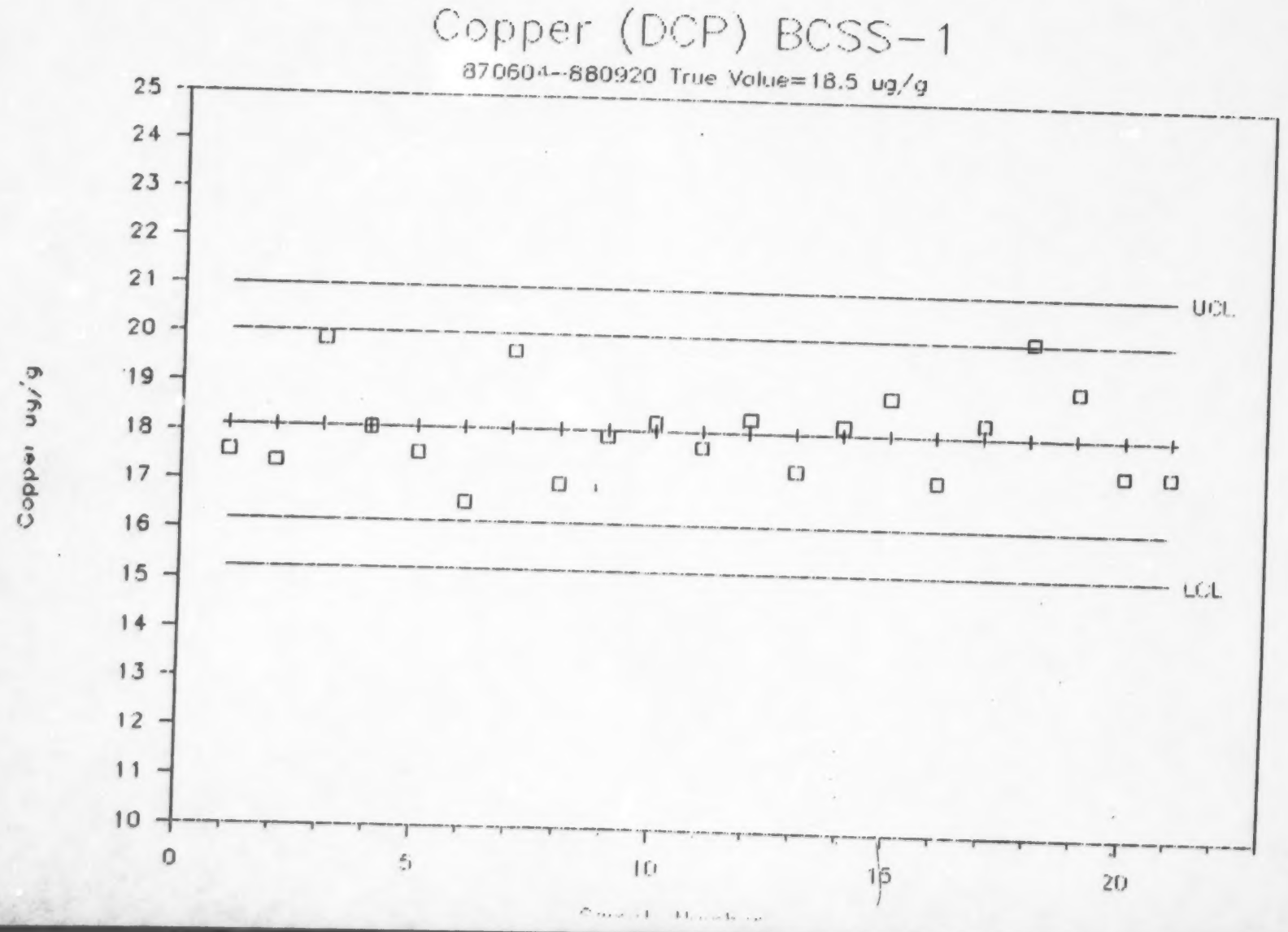

Vanadium (DCP) BCSS-1
870730-880829
Vanadium ug/g
66
64
62
60
58
56
54
52
50
48
46
44
42
40
38
36
34
UCL
LCL
0
1
2
3
4
5
6
7
8
9
10
11

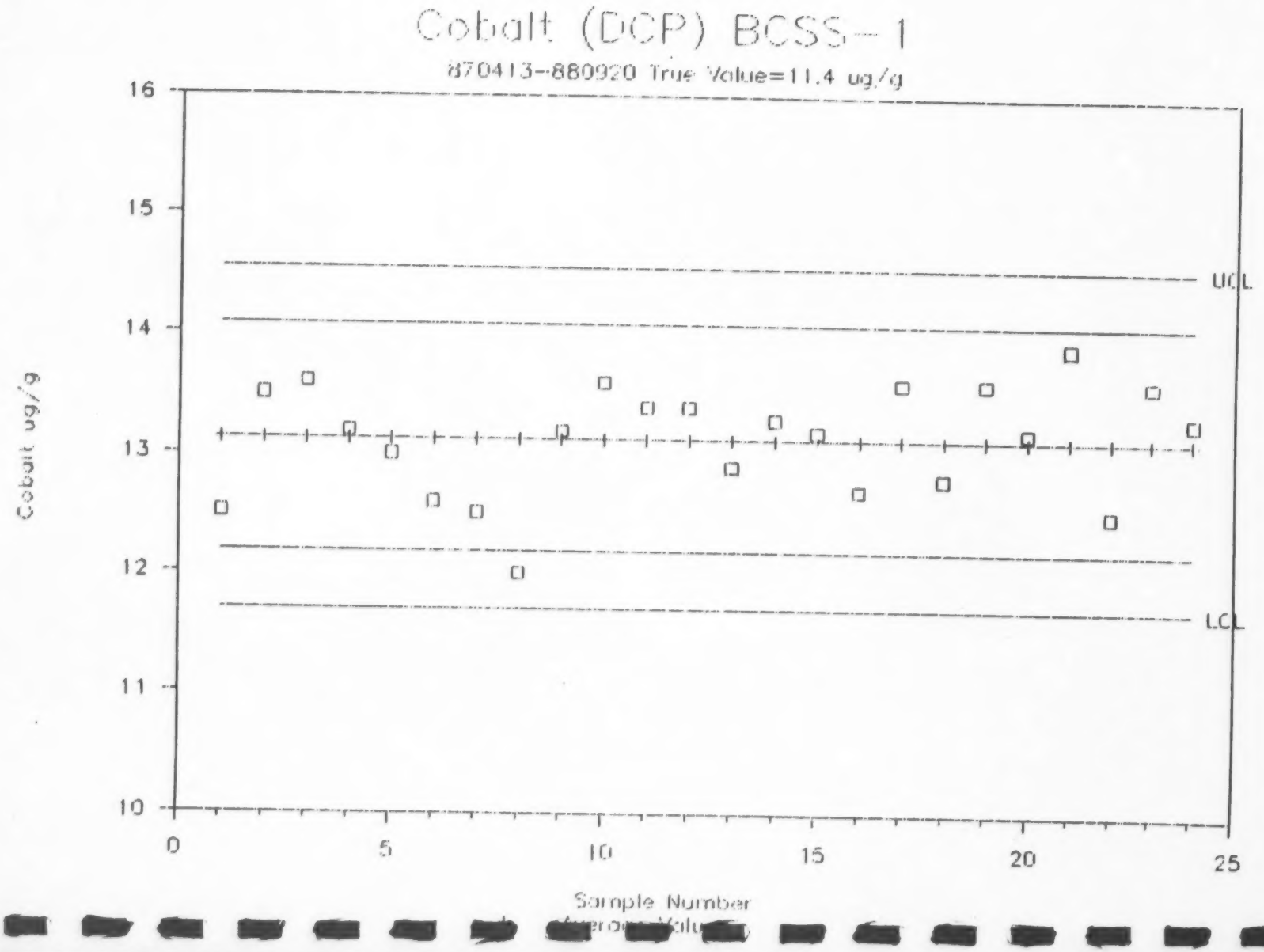

Magnesium (DCP) BCSS-1
870724-880829 True Value=14720 ug/g
Magnesium ug/g (Thousands)
15
14
13
12
11
10
9
UCL
LCL
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
Sample Number

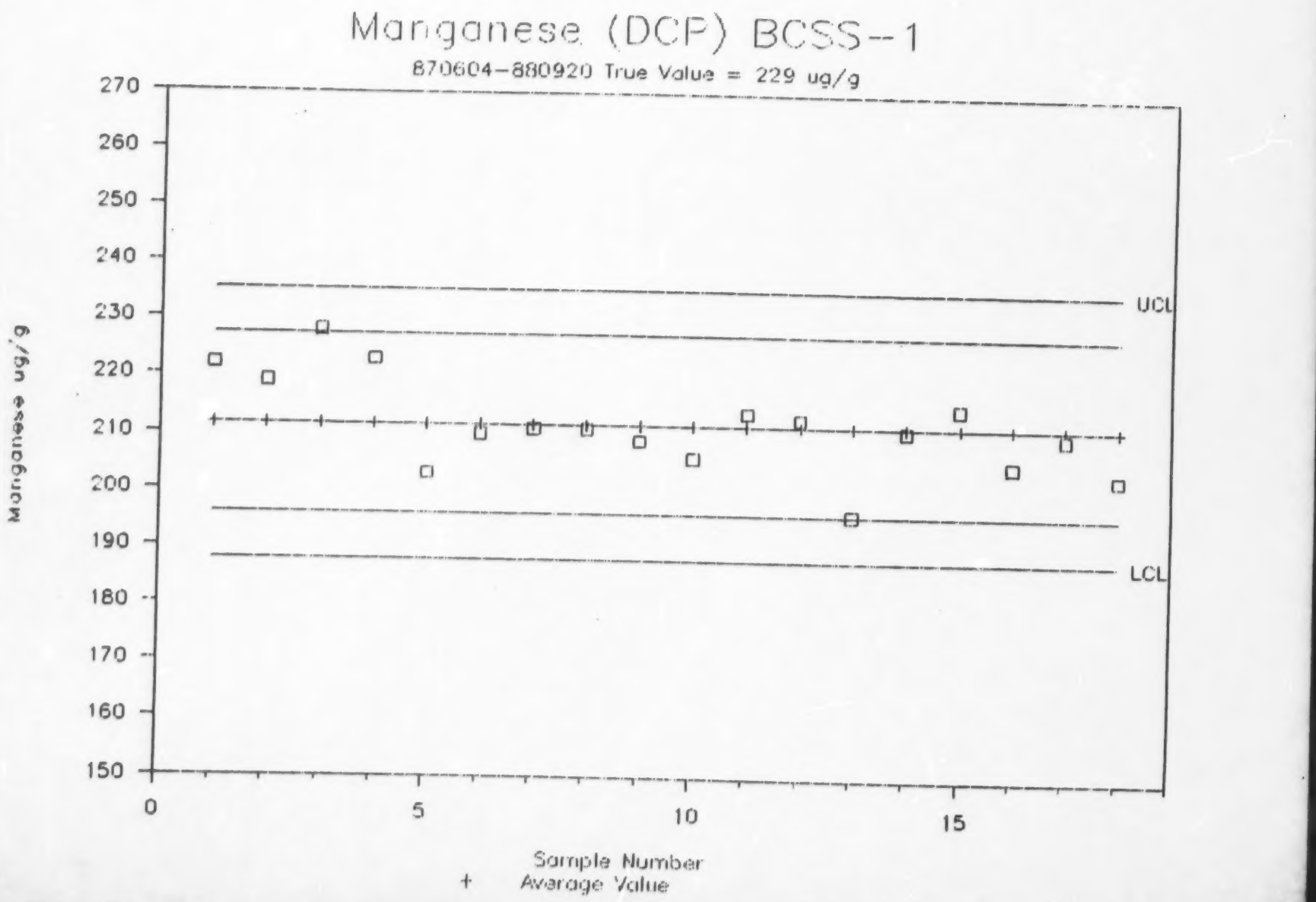

Calcium (DCP) BCSS-1
870724--880902 True Value=5430 ug/g
Calcium ug/g
(Thousands)
5
4.8
4.6
4.4
4.2
4
3.8
3.6
3.4
3.2
3
2.8
2.6
2.4
UCL
LCL
0
5
10
15
Sample Number
Average Value

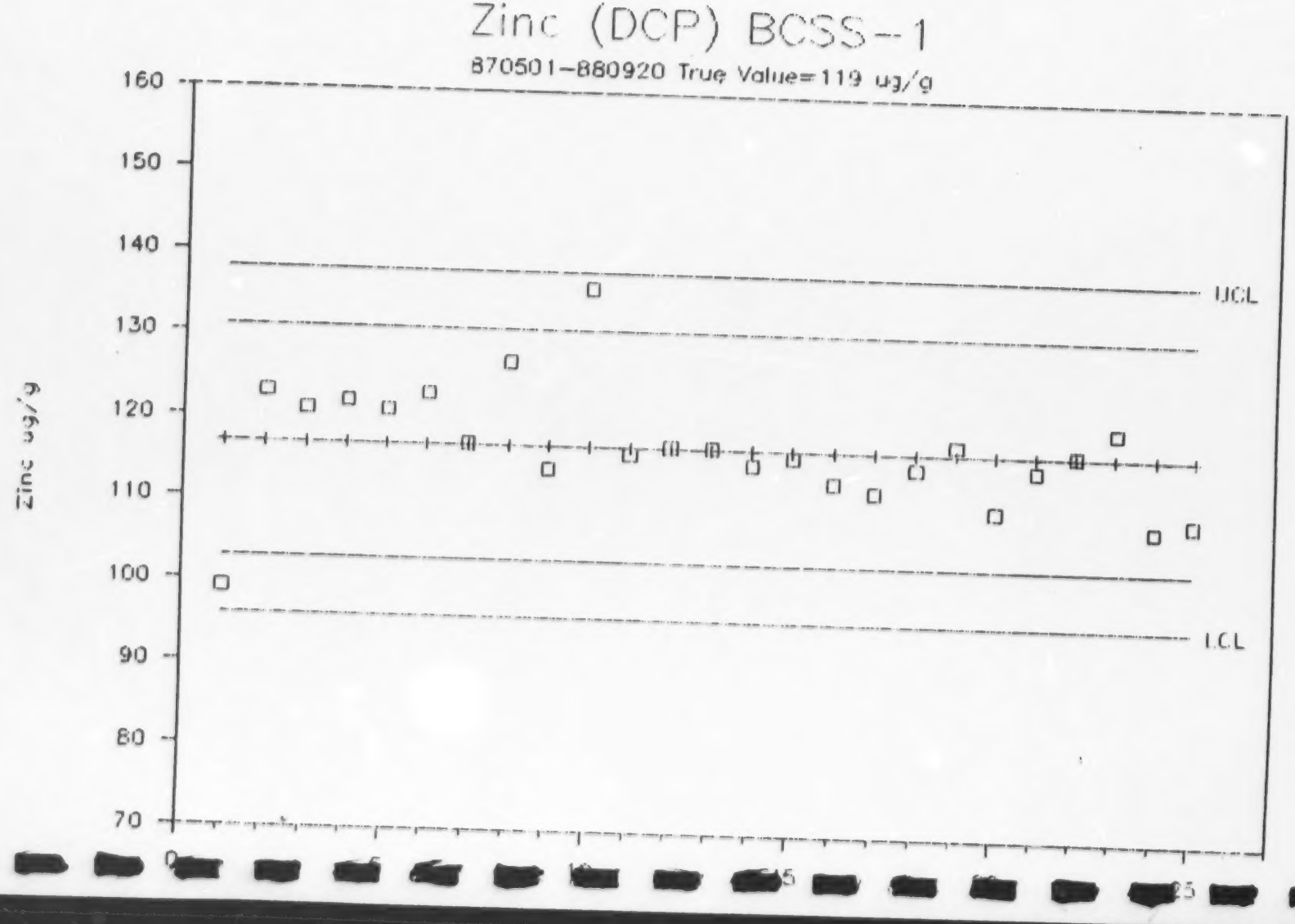

Beryllium (DCP) BCSS-1
870513-881005 True Value = 1.3 ug/g
Beryllium ug/g
2.2
2.1
2
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
UCL
LCL
0
5
10
Sample Number
+ Average Value


Chromium (DCP) BCSS-1
870604-880920 True Value = 123 ug/g
90
80
70
60
50
40
UCL
LCL
Chromium ug/g
0
5
10
15
20
Sample Number


Copper (DCP) BCSS-1
870604--880920 True Value=18.5 ug/g
Copper ug/g
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
0
5
10
15
20
UCL
LCL

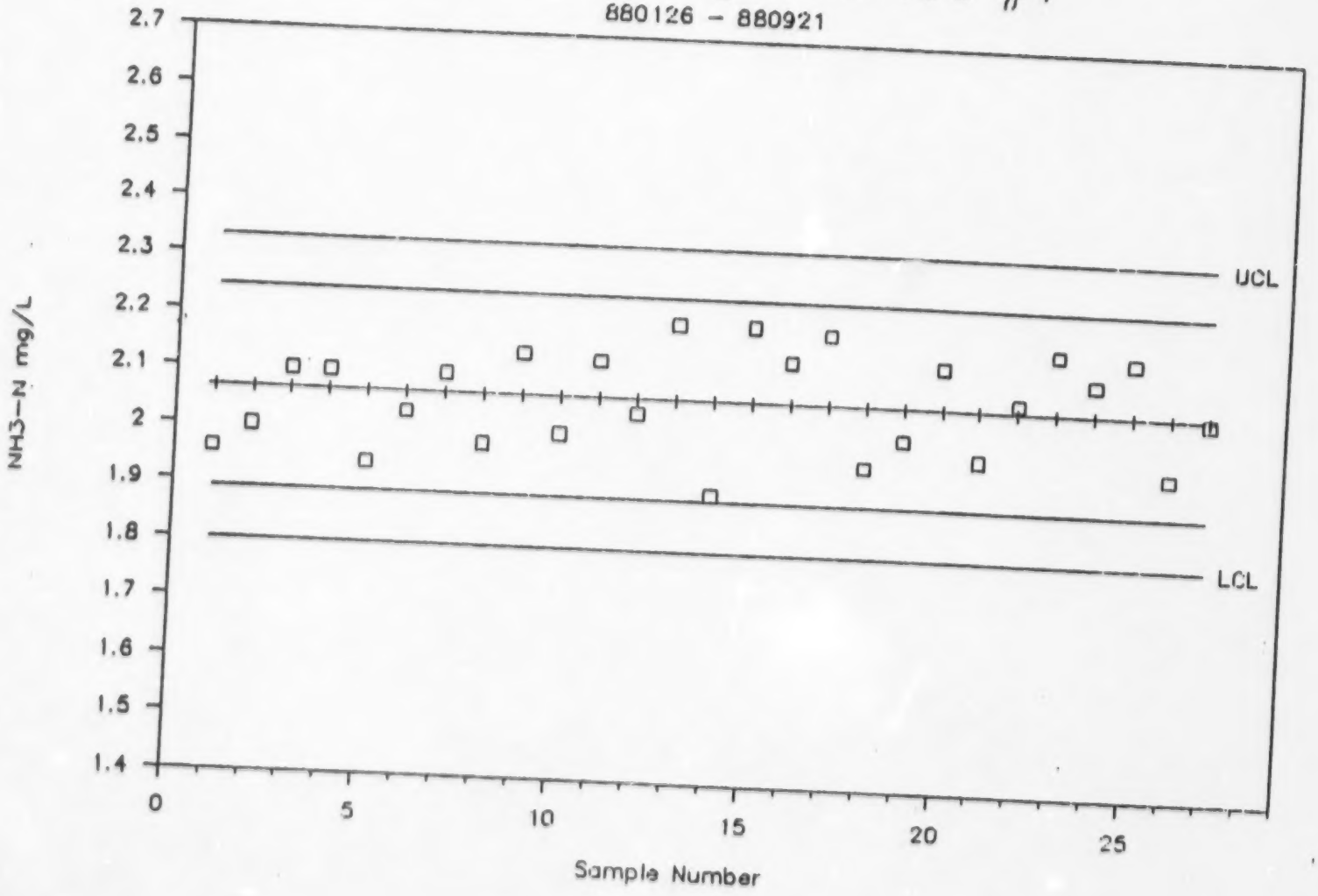

Cobalt (DCP) BCSS-1
870413--880920 True Value=11.4 ug/g
16
15
14
13
12
11
10
UCL
LCL
Cobalt ug/g
0
5
10
15
20
25
Sample Number


Manganese (DCP) BCSS--1
870604-880920 True Value = 229 ug/g
270
260
250
240
230
220
210
200
190
180
170
160
150
Manganese ug/g
UCL
LCL
0
5
10
15
Sample Number
+ Average Value

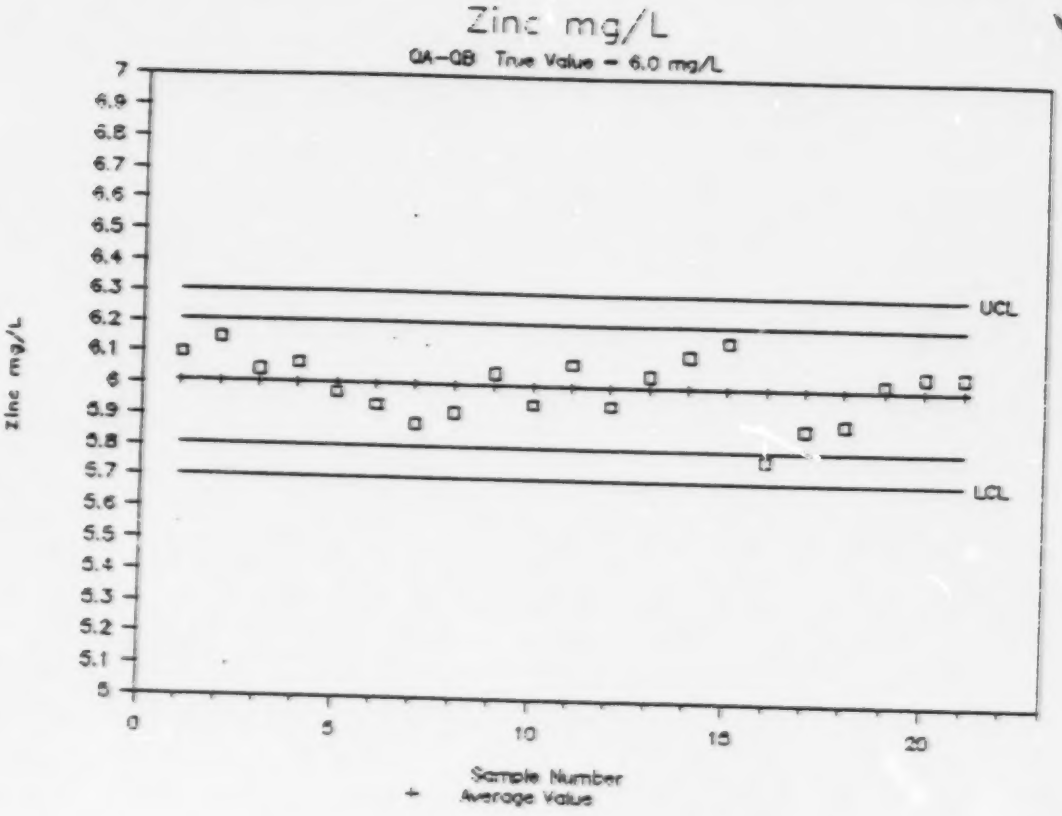

Zinc (DCP) BCSS-1
870501-880920 True Value=119 ug/g
160
150
140
130
120
110
100
90
80
70
Zinc ug/g
UCL
LCL
0
5
25

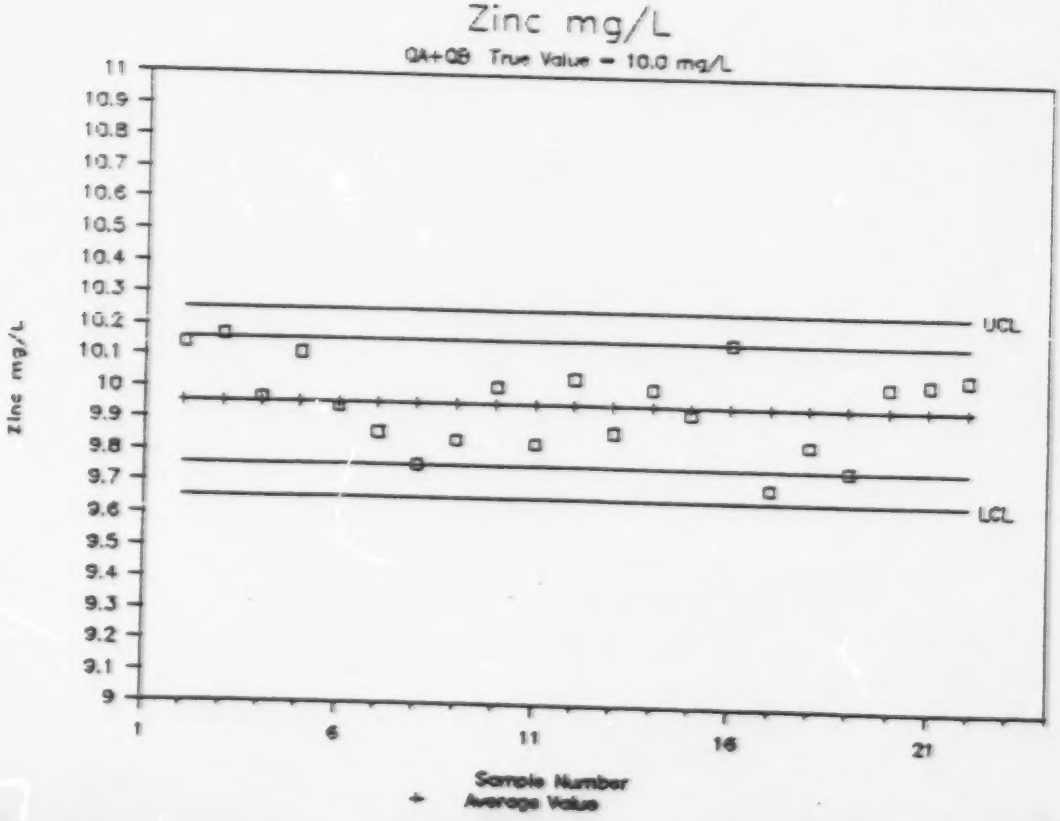
Ammonia Nitrogen WP486 #1

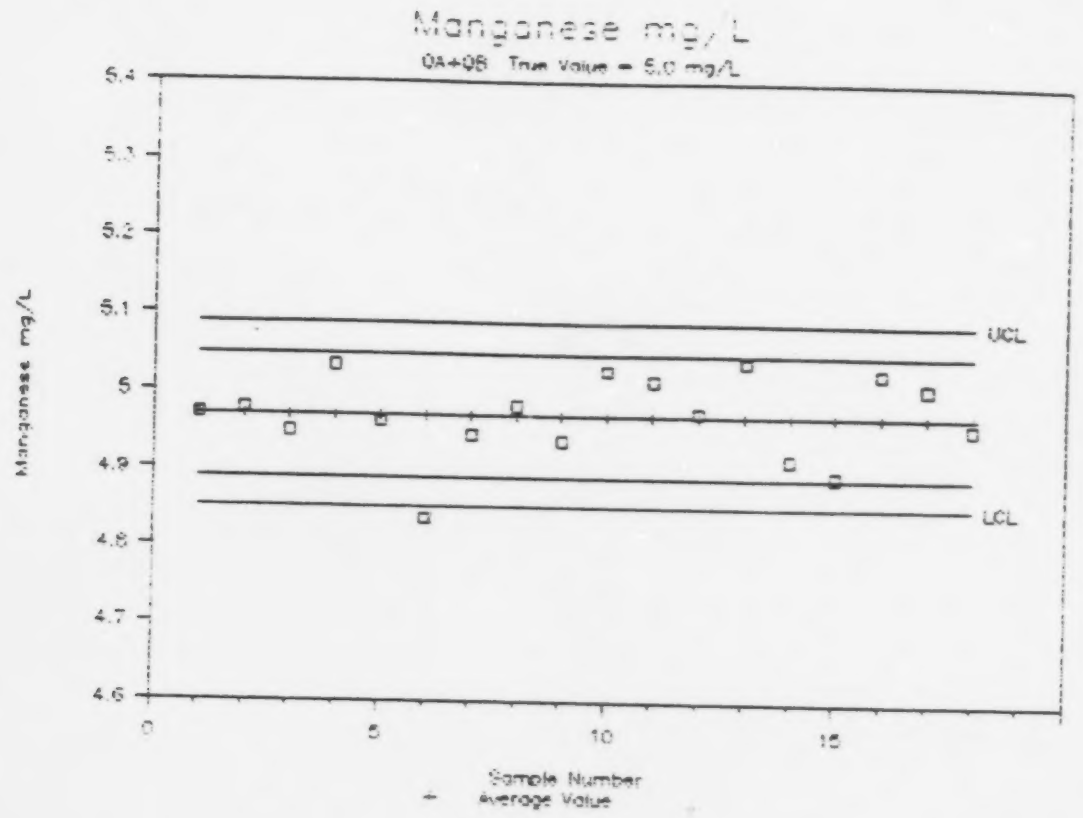
880126 - 880921

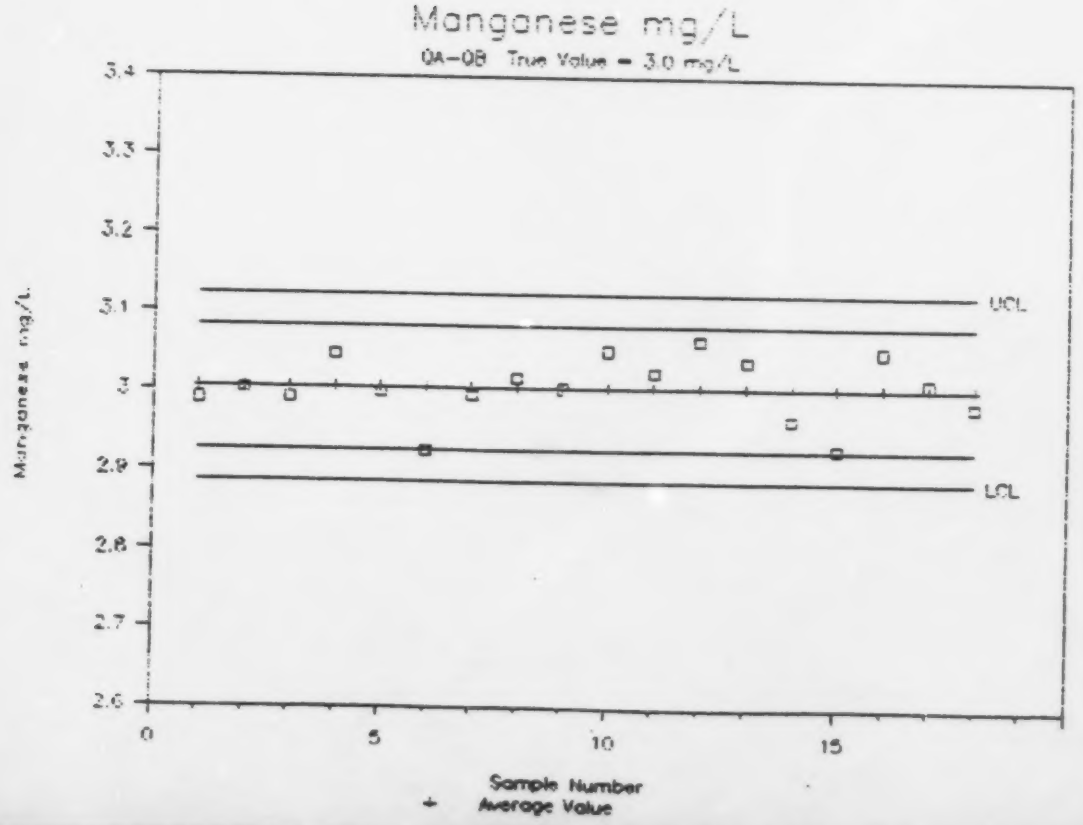


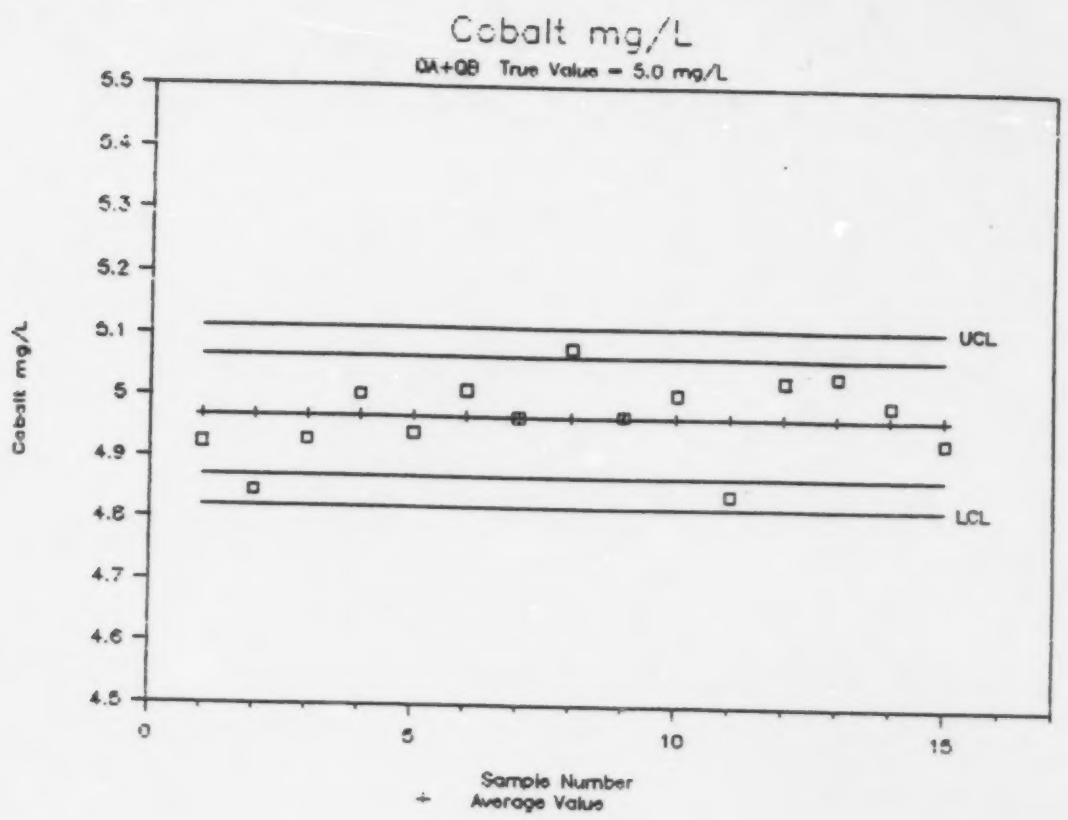
SELECTED CONTROL CHARTS FOR
CALIBRATION CONTROL SAMPLES ANALYZED
WITH ALGOMA-STELCO SAMPLES

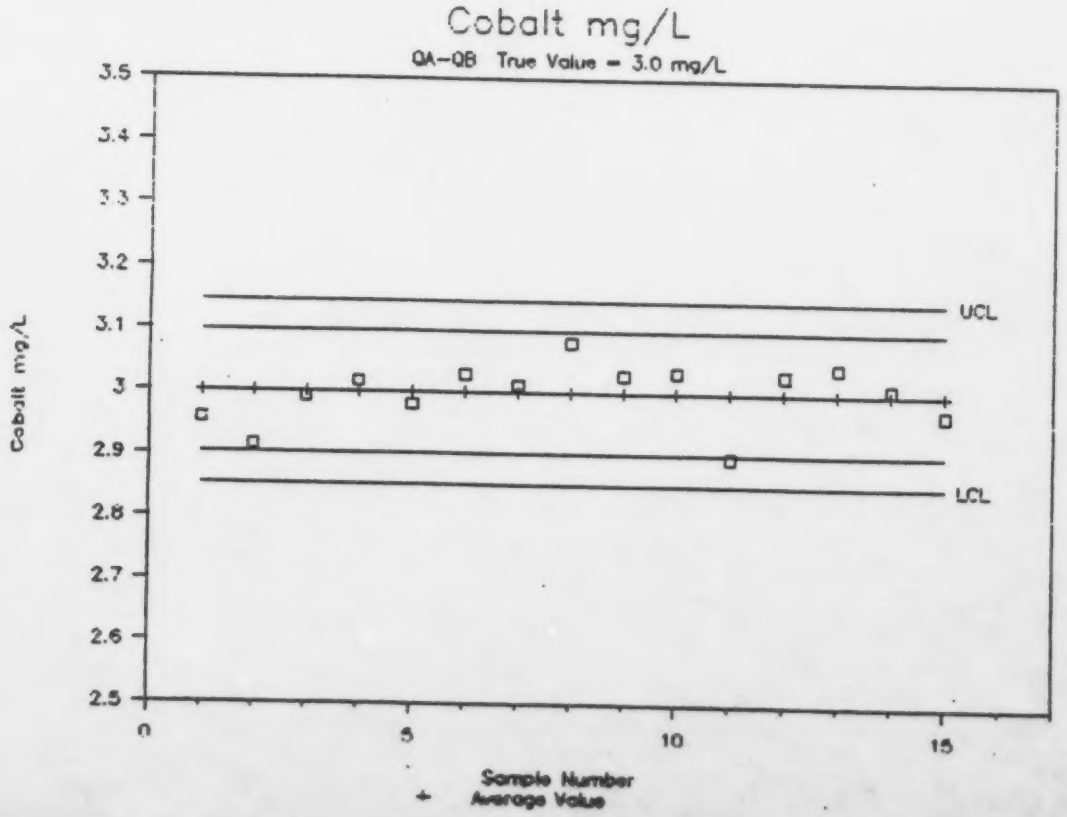

Zinc mg/L
QA-QB True Value = 6.0 mg/L
Zinc mg/L
7
6.9
6.8
6.7
6.6
6.5
6.4
6.3
6.2
6.1
6
5.9
5.8
5.7
5.6
5.5
5.4
5.3
5.2
5.1
5
UCL
LCL
0
5
10
15
20
Sample Number
Average Value

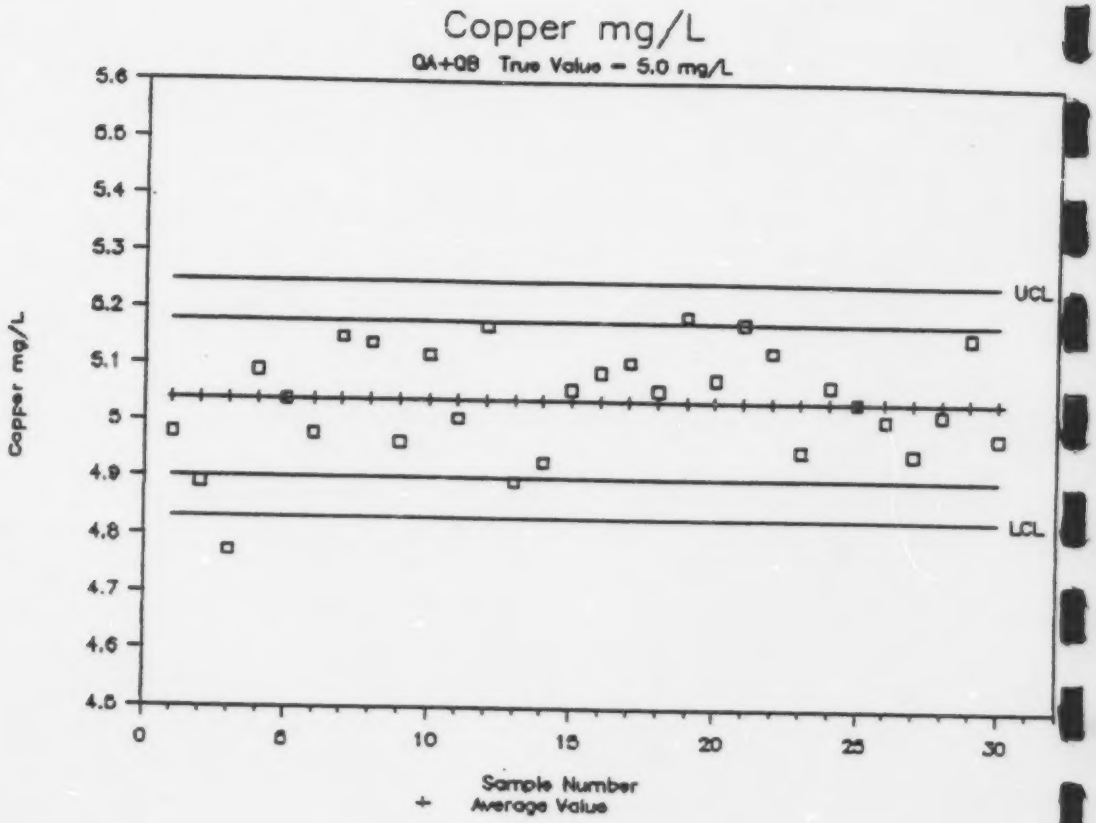

Zinc mg/L
QA+QB True Value = 10.0 mg/L
Zinc mg/L
11
10.9
10.8
10.7
10.6
10.5
10.4
10.3
10.2
10.1
10
9.9
9.8
9.7
9.6
9.5
9.4
9.3
9.2
9.1
9
UCL
LCL
1
6
11
16
21
Sample Number
Average Value

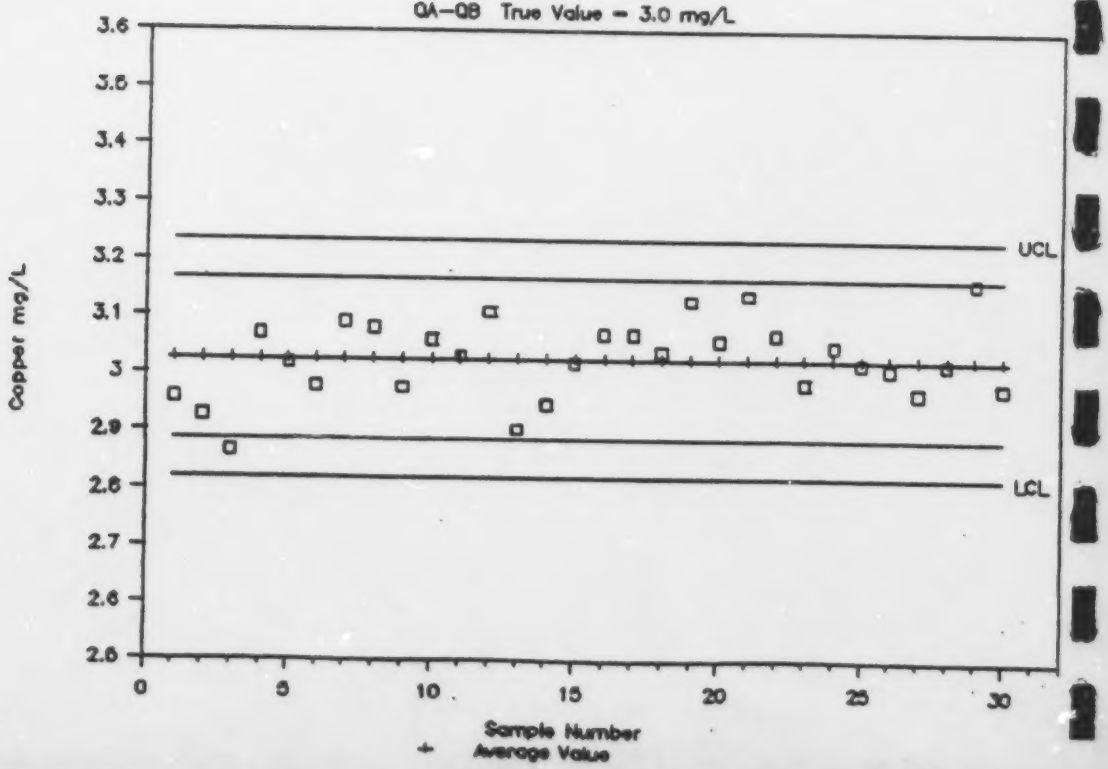

Manganese mg/L
0A+0B True Value = 5.0 mg/L
Manganese mg/L
5.4
5.3
5.2
5.1
5
4.9
4.8
4.7
4.6
UCL
LCL
0
5
10
15
Sample Number
Average Value

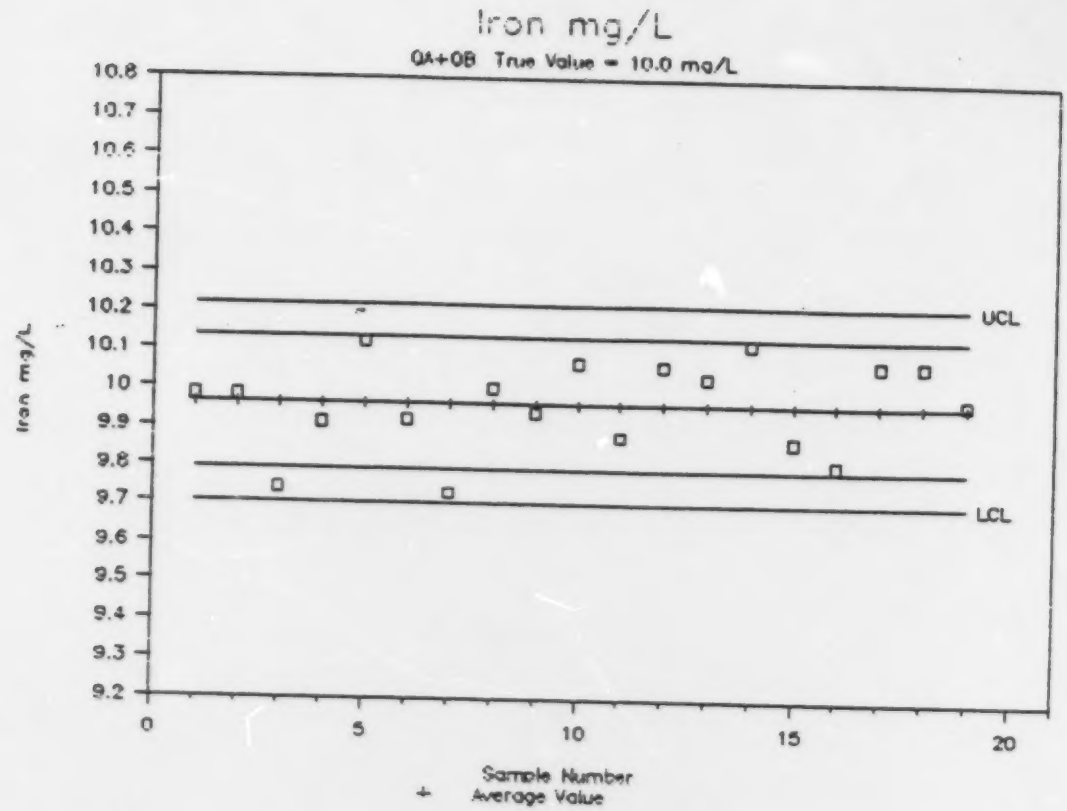

Manganese mg/L
0A-0B True Value = 3.0 mg/L
Manganese mg/L
3.4
3.3
3.2
3.1
3
2.9
2.8
2.7
2.6
UCL
LCL
0
5
10
15
Sample Number
Average Value

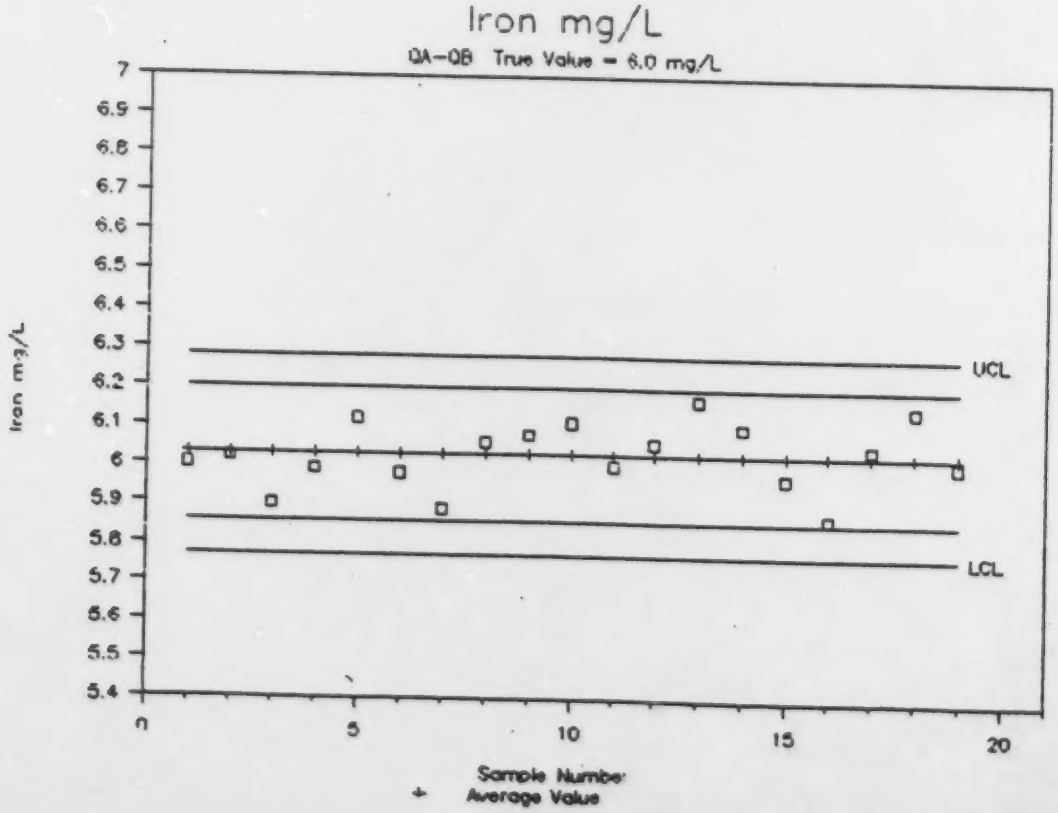

Cobalt mg/L
QA+QB True Value = 5.0 mg/L
Cobalt mg/L
5.5
5.4
5.3
5.2
5.1
5
4.9
4.8
4.7
4.6
4.5
UCL
LCL
0
5
10
15
Sample Number
Average Value

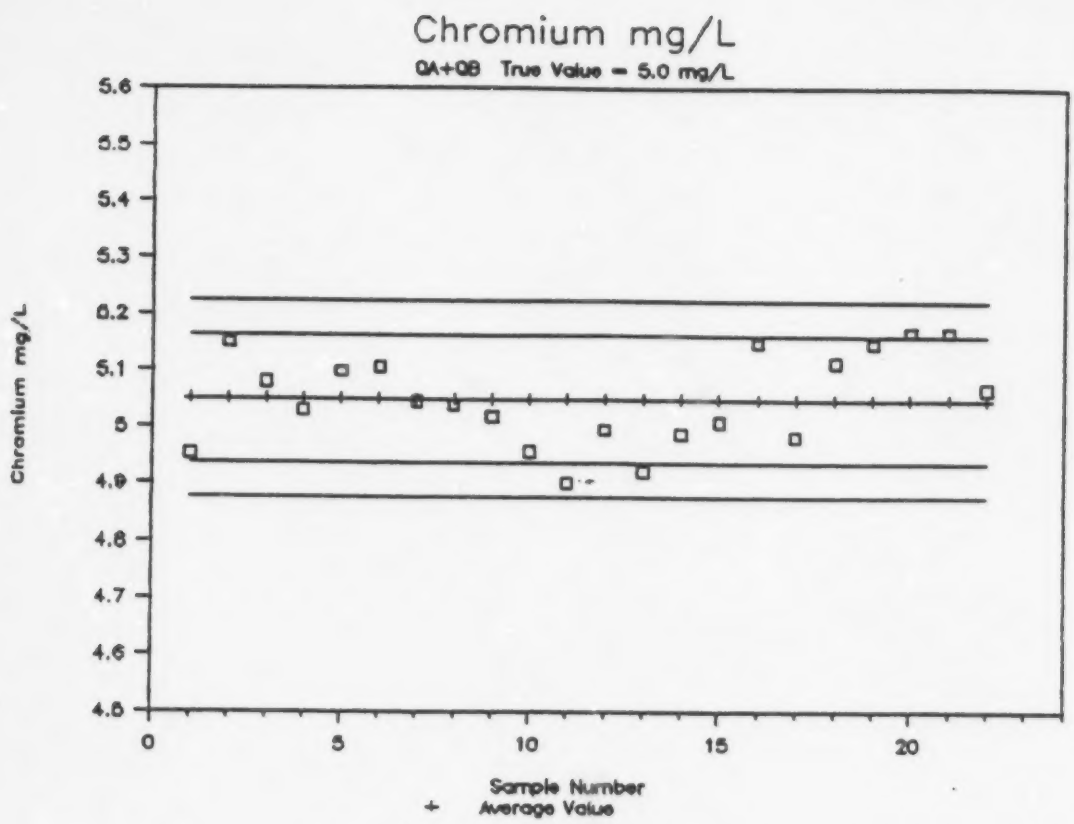

Cobalt mg/L
QA-QB True Value = 3.0 mg/L
Cobalt mg/L
3.5
3.4
3.3
3.2
3.1
3
2.9
2.8
2.7
2.6
2.5
UCL
LCL
0
5
10
15
Sample Number
Average Value

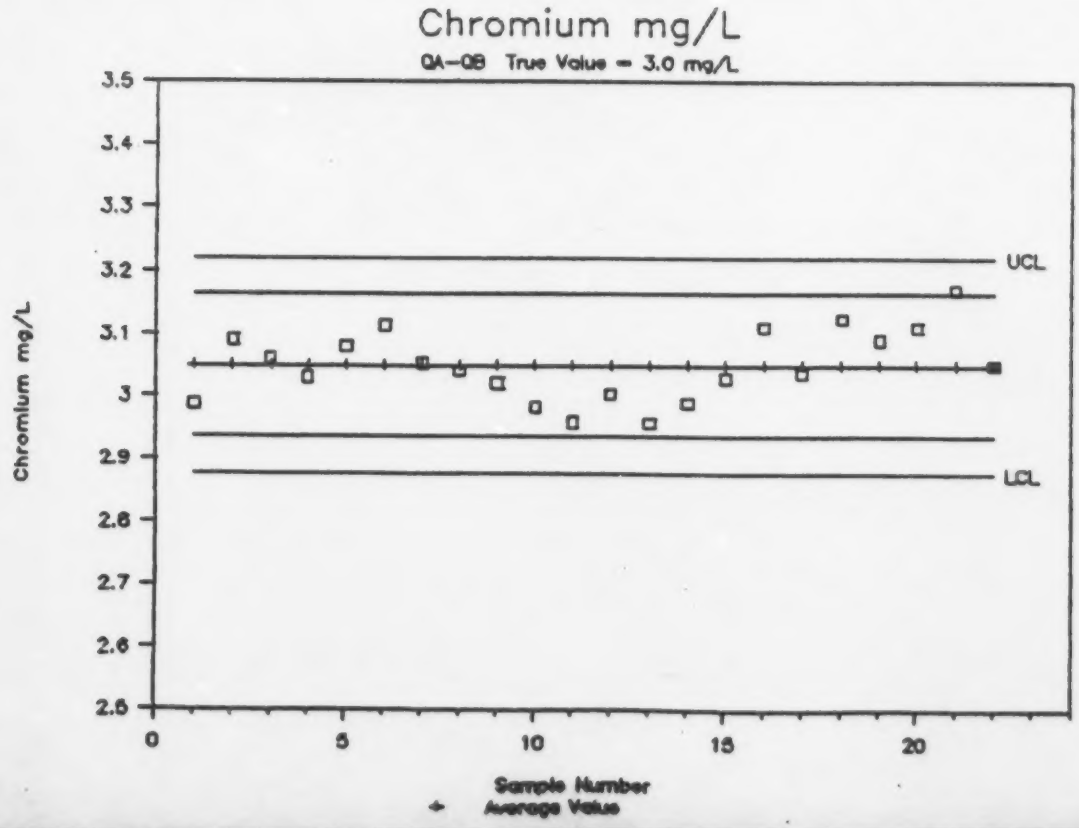

Copper mg/L
QA+QB True Value = 5.0 mg/L
Copper mg/L
5.6
5.5
5.4
5.3
5.2
5.1
5
4.9
4.8
4.7
4.6
4.5
UCL
LCL
0
5
10
15
20
25
30
Sample Number
Average Value

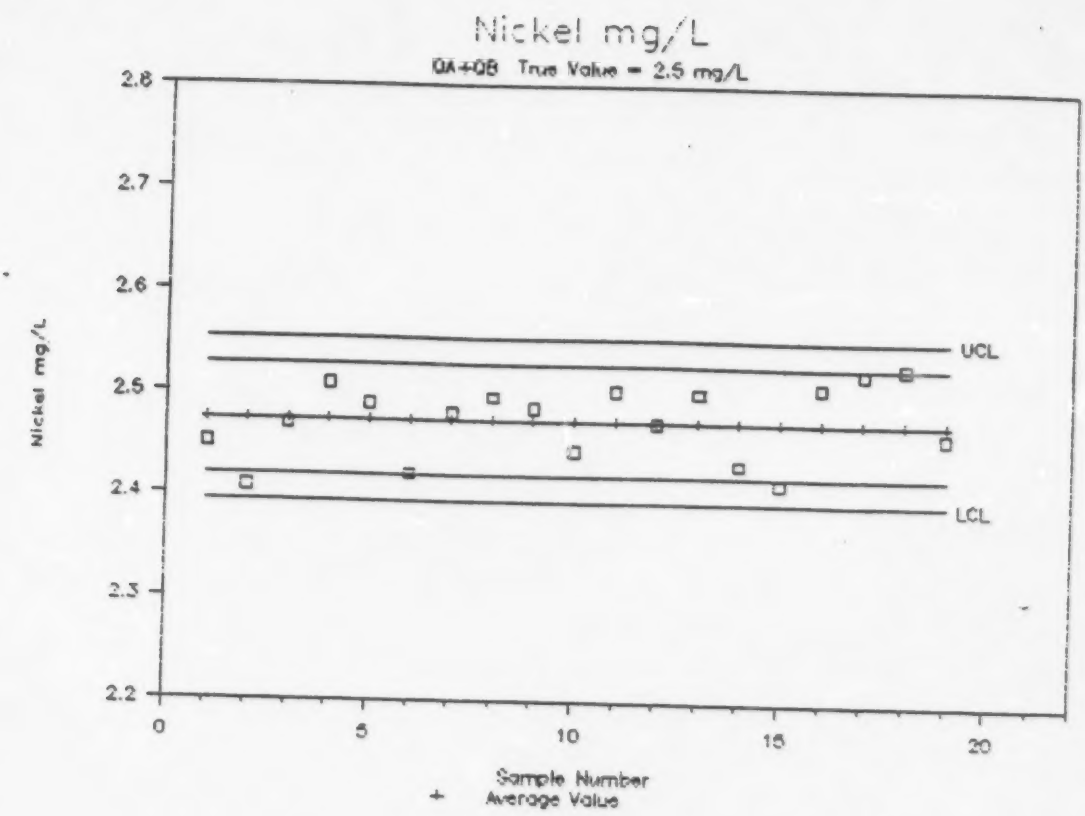

Copper mg/L
QA−QB True Value = 3.0 mg/L
Copper mg/L
3.6
3.5
3.4
3.3
3.2
3.1
3
2.9
2.8
2.7
2.6
2.5
UCL
LCL
0
5
10
15
20
25
30
Sample Number
Average Value

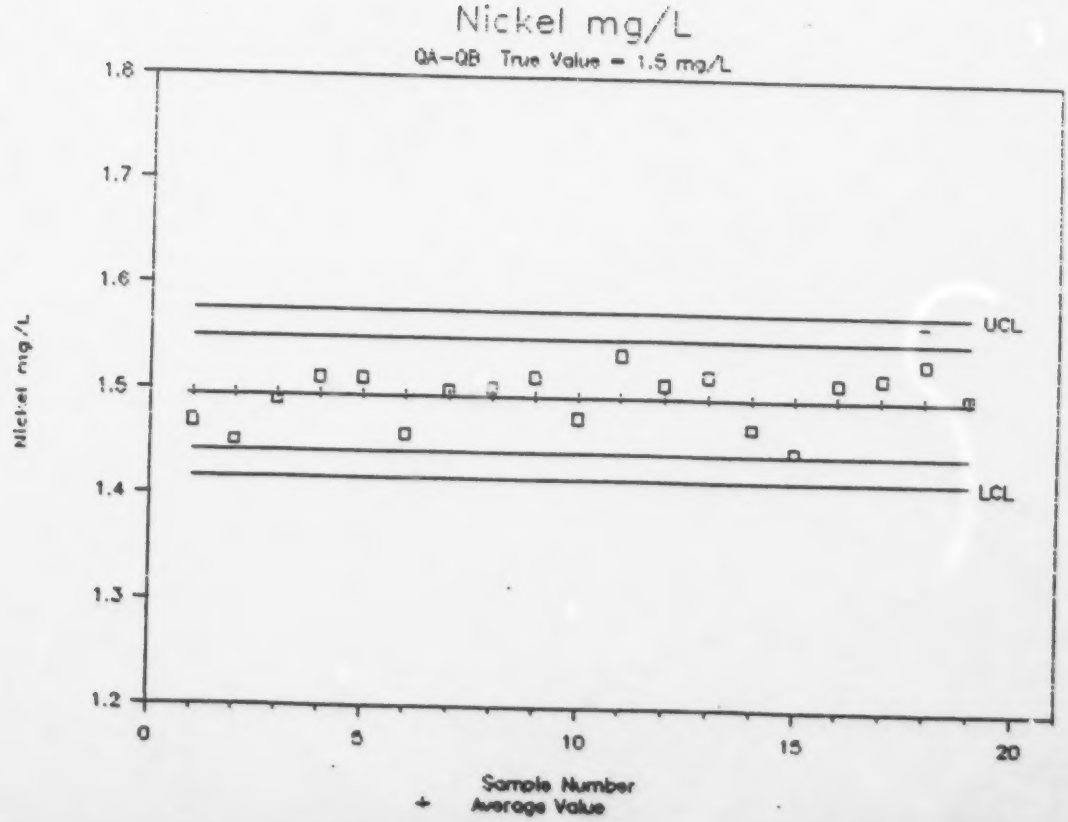

Iron mg/L
QA+QB True Value = 10.0 mg/L
Iron mg/L
10.8
10.7
10.6
10.5
10.4
10.3
10.2
10.1
10
9.9
9.8
9.7
9.6
9.5
9.4
9.3
9.2
UCL
LCL
0
5
10
15
20
Sample Number
Average Value

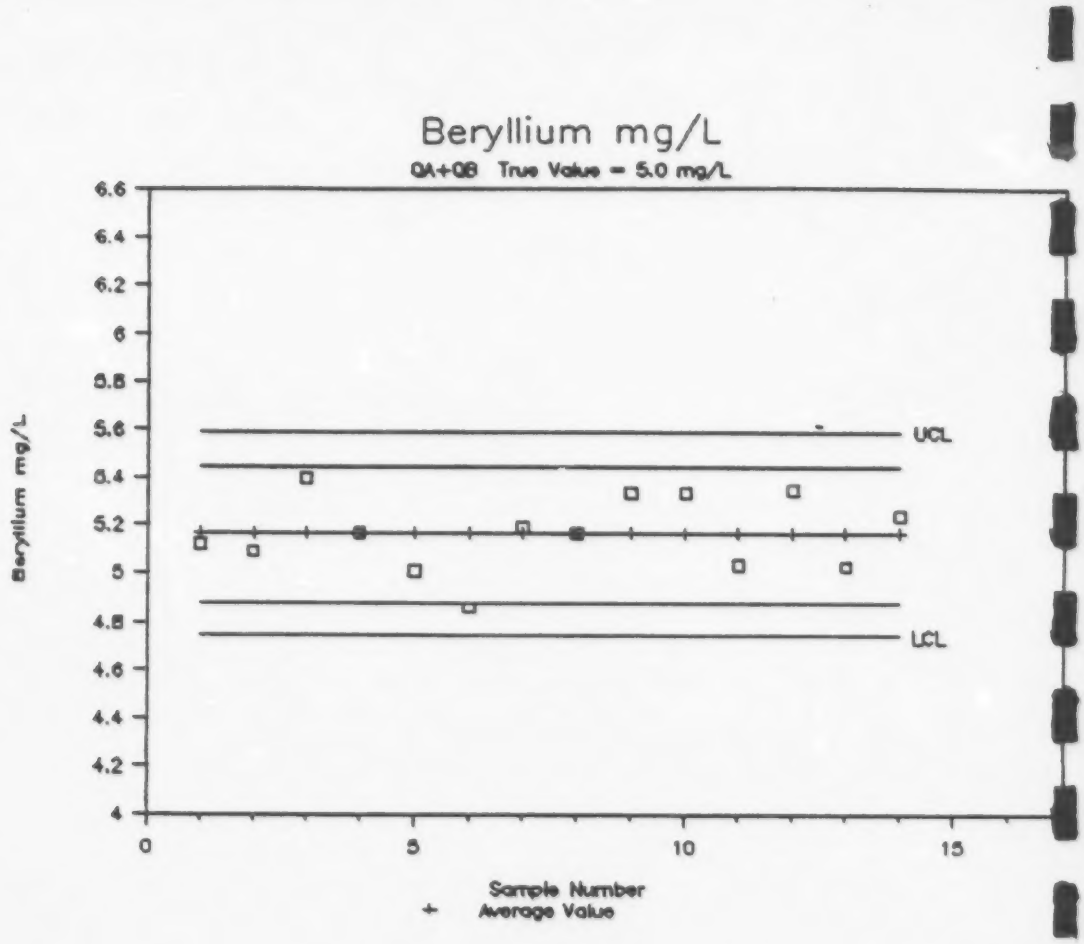

Iron mg/L
QA−QB True Value = 6.0 mg/L
Iron mg/L
7
6.9
6.8
6.7
6.6
6.5
6.4
6.3
6.2
6.1
6
5.9
5.8
5.7
5.6
5.5
5.4
UCL
LCL
0
5
10
15
20
Sample Number
Average Value

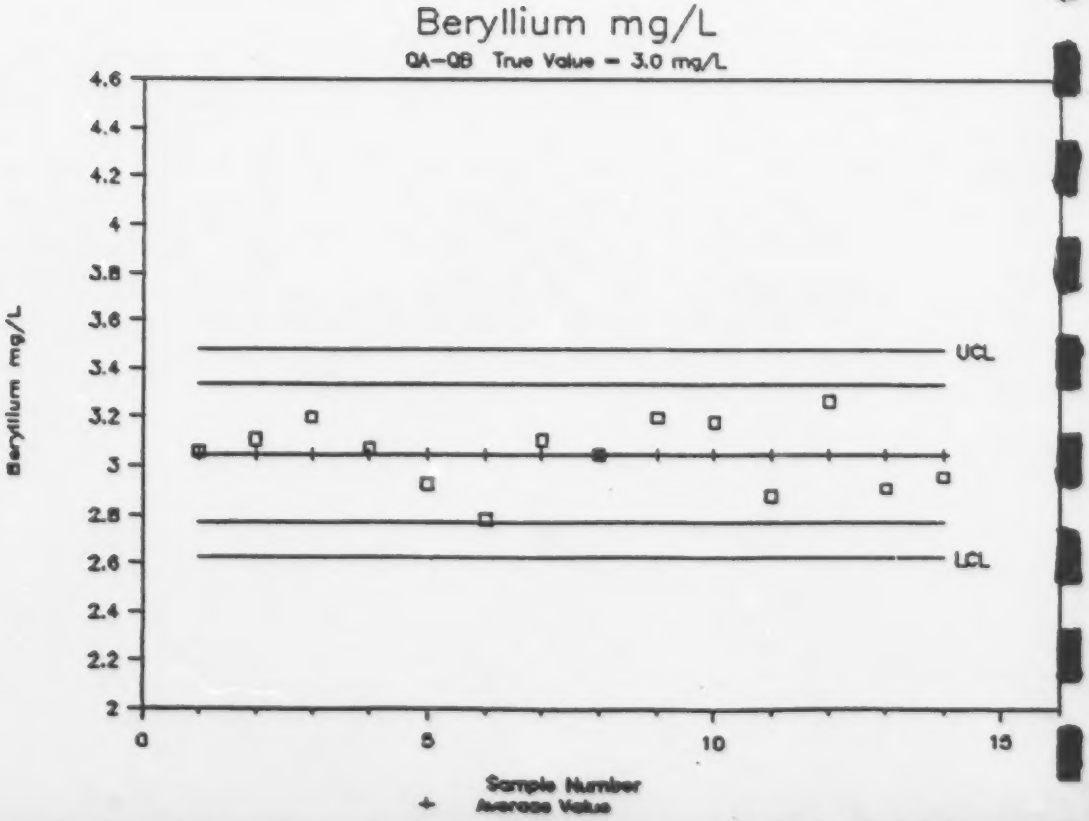

Chromium mg/L
QA+QB True Value = 5.0 mg/L
Chromium mg/L
5.6
5.5
5.4
5.3
5.2
5.1
5
4.9
4.8
4.7
4.6
4.5
0
5
10
15
20
Sample Number
Average Value

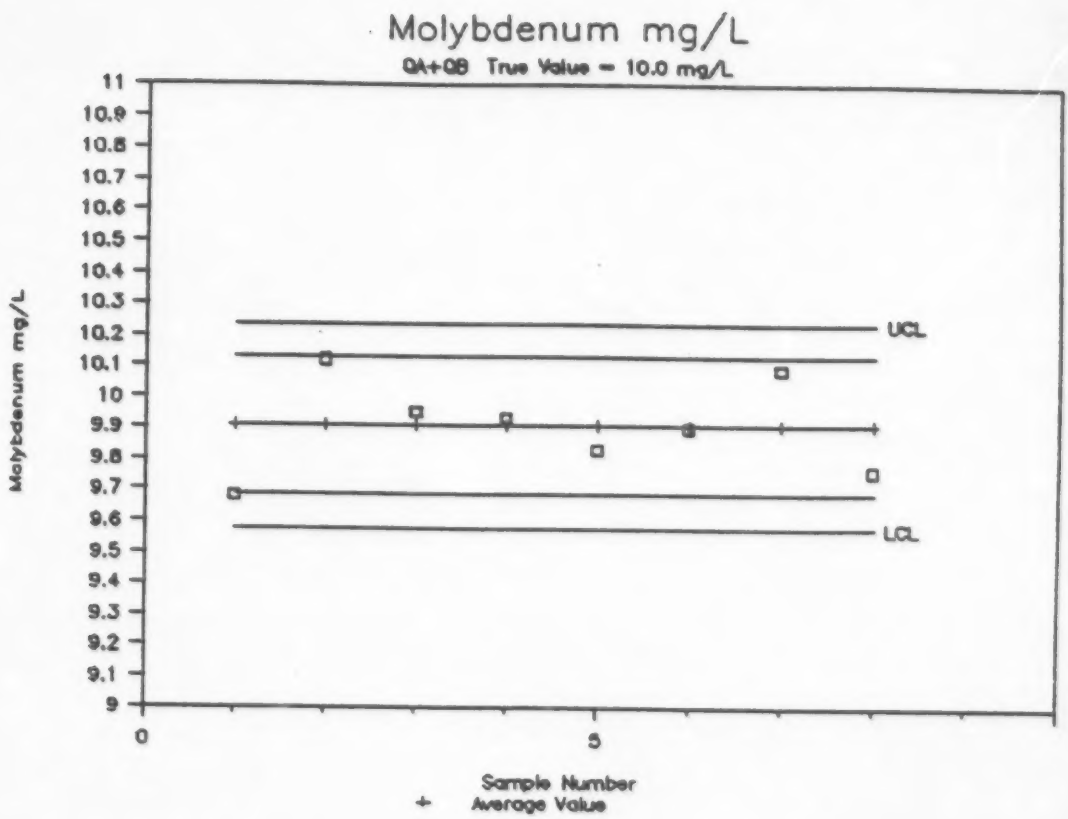

Chromium mg/L
QA−QB True Value = 3.0 mg/L
Chromium mg/L
3.5
3.4
3.3
3.2
3.1
3
2.9
2.8
2.7
2.6
2.5
UCL
LCL
0
5
10
15
20
Sample Number
Average Value

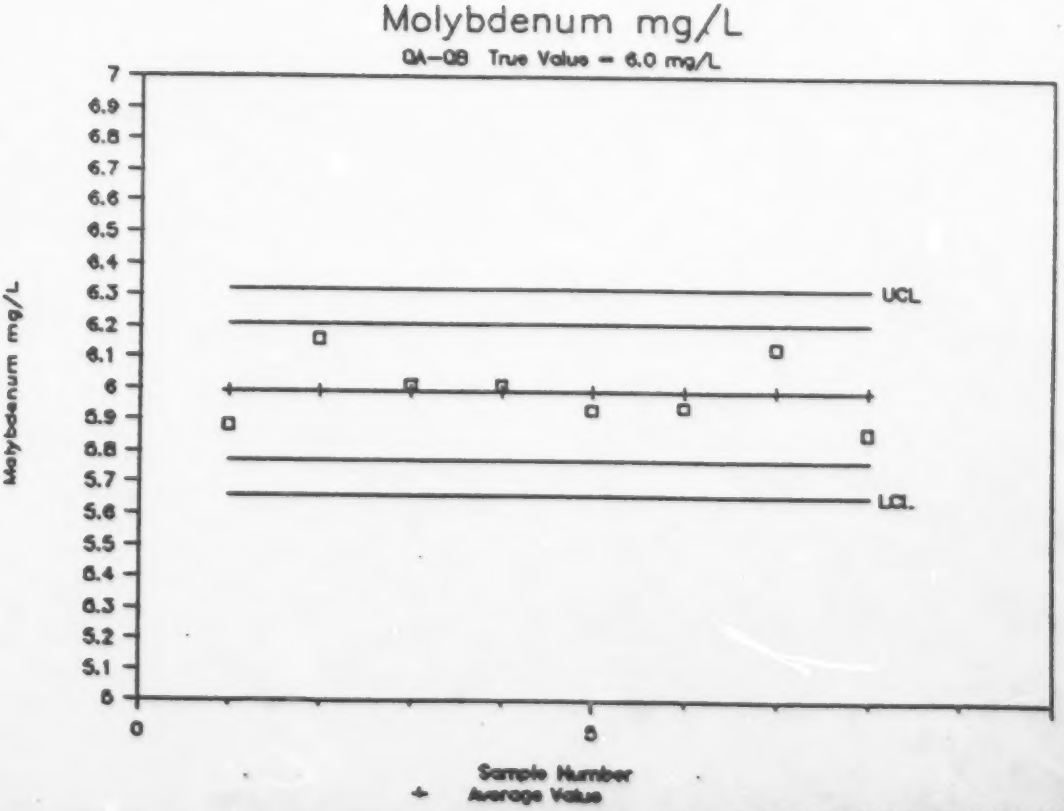

Nickel mg/L
QA+QB True Value = 2.5 mg/L
Nickel mg/L
2.8
2.7
2.6
2.5
2.4
2.3
2.2
UCL
LCL
0
5
10
15
20
Sample Number
+ Average Value

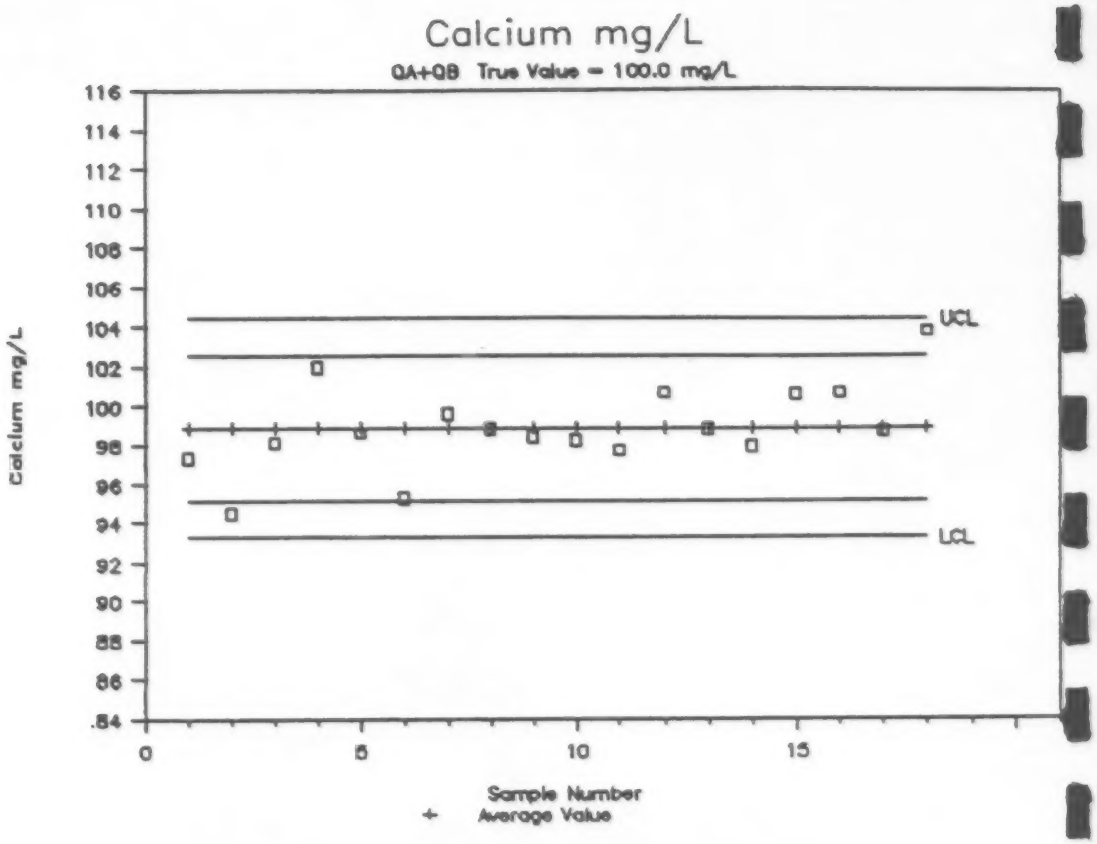

Nickel mg/L
QA-QB True Value = 1.5 mg/L
Nickel mg/L
1.8
1.7
1.6
1.5
1.4
1.3
1.2
UCL
LCL
0
5
10
15
20
Sample Number
+ Average Value

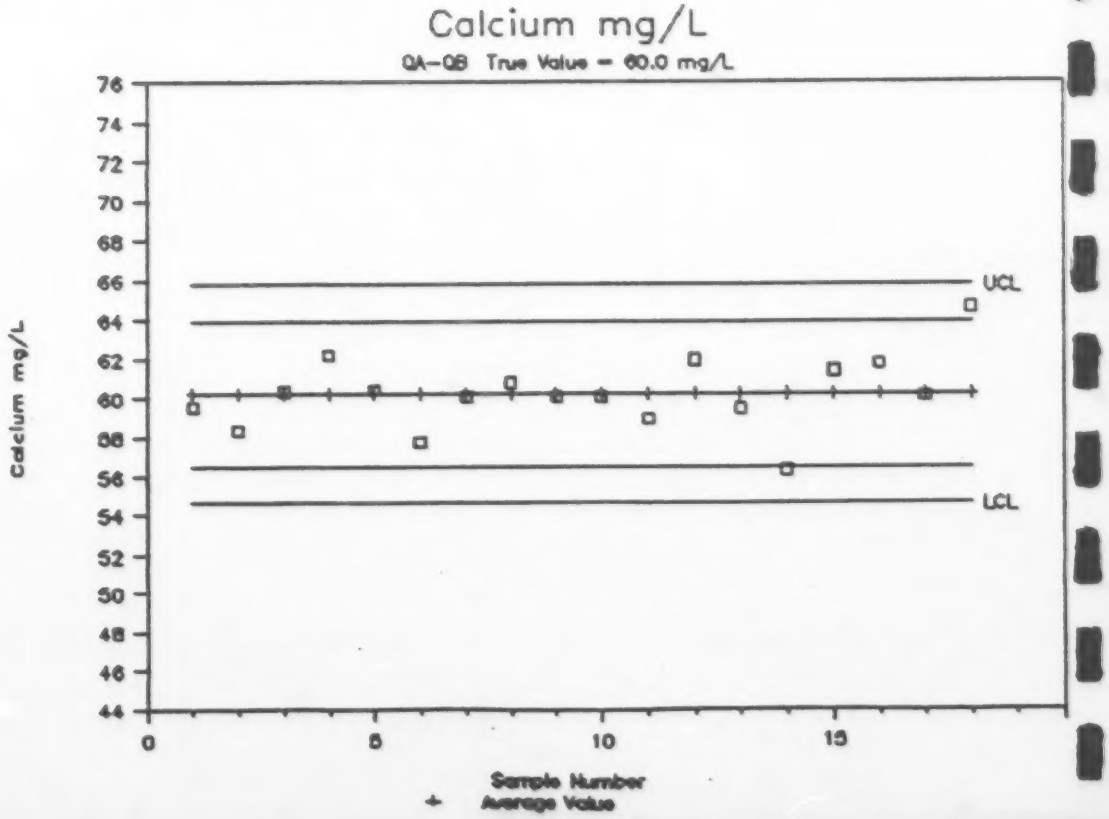

Beryllium mg/L
QA+QB True Value = 5.0 mg/L
Beryllium mg/L
6.6
6.4
6.2
6
5.8
5.6
5.4
5.2
5
4.8
4.6
4.4
4.2
4
UCL
LCL
0
5
10
15
Sample Number
Average Value

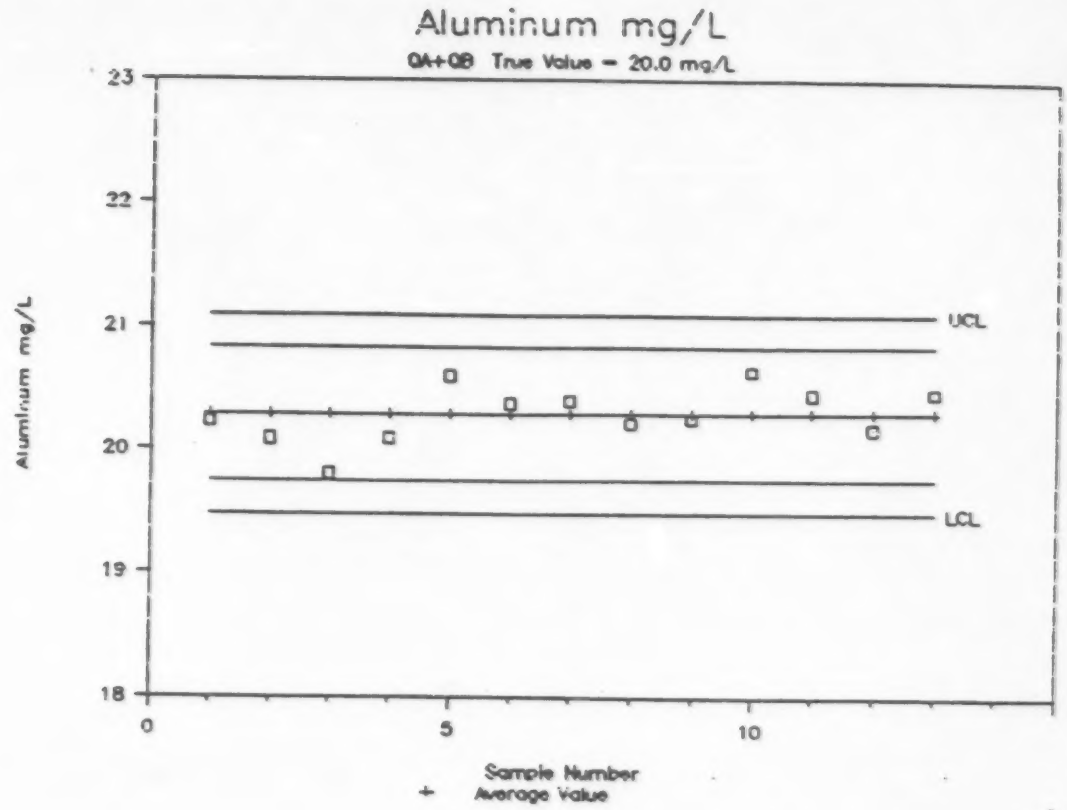

Beryllium mg/L
QA−QB True Value = 3.0 mg/L
Beryllium mg/L
4.6
4.4
4.2
4
3.8
3.6
3.4
3.2
3
2.8
2.6
2.4
2.2
2
UCL
LCL
0
5
10
15
Sample Number
Average Value

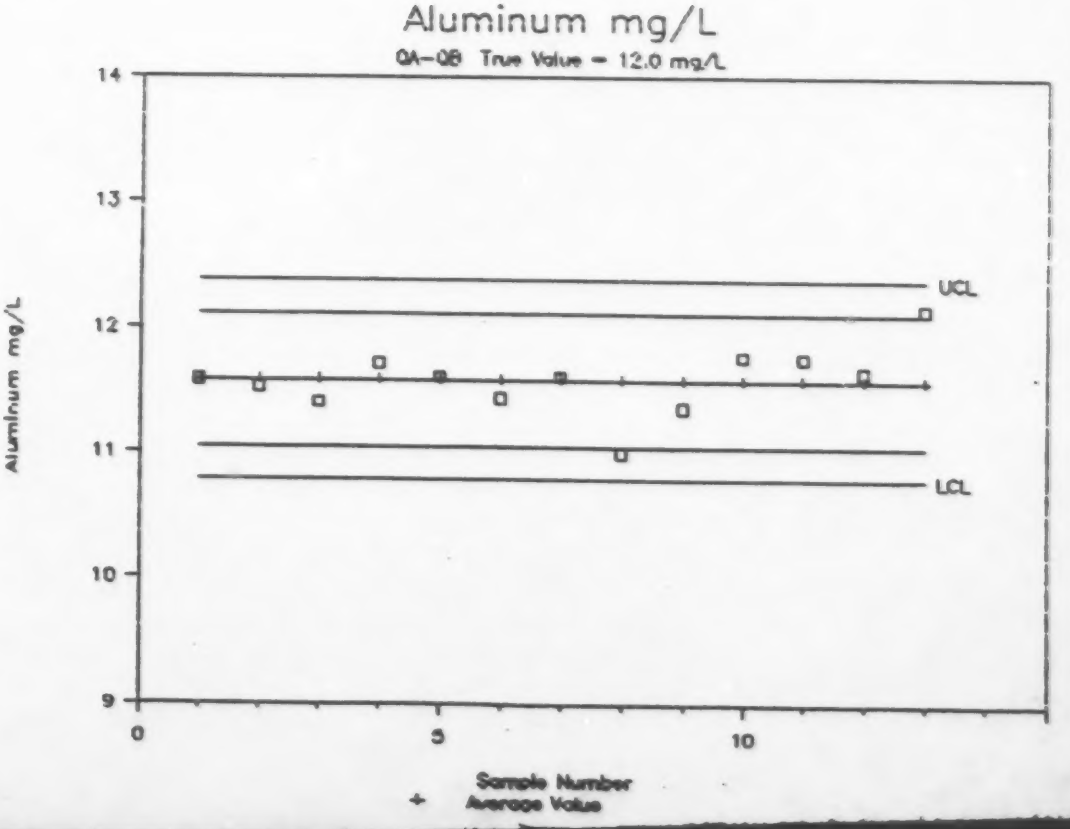

Molybdenum mg/L
QA+QB True Value = 10.0 mg/L
Molybdenum mg/L
11
10.9
10.8
10.7
10.6
10.5
10.4
10.3
10.2
10.1
10
9.9
9.8
9.7
9.6
9.5
9.4
9.3
9.2
9.1
9
UCL
LCL
0
5
Sample Number
Average Value

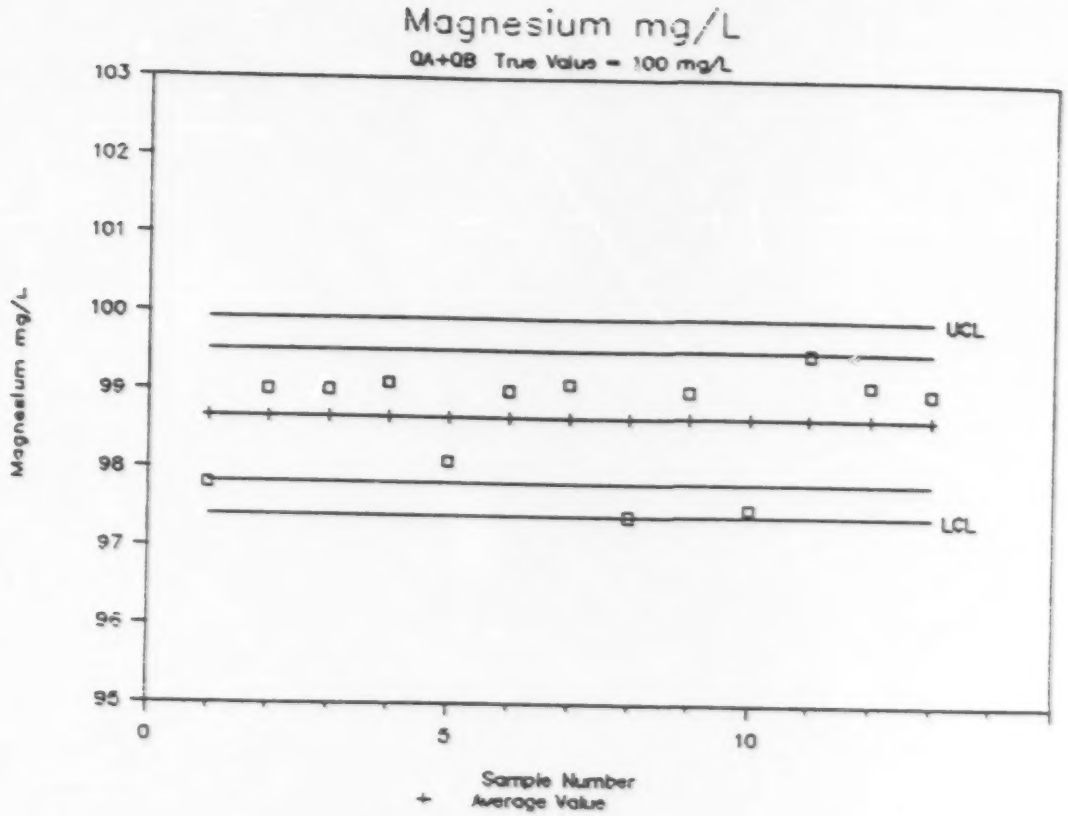

Molybdenum mg/L
QA−QB True Value = 6.0 mg/L
Molybdenum mg/L
7
6.9
6.8
6.7
6.6
6.5
6.4
6.3
6.2
6.1
6
5.9
5.8
5.7
5.6
5.5
5.4
5.3
5.2
5.1
5
UCL
LCL
0
5
Sample Number
Average Value

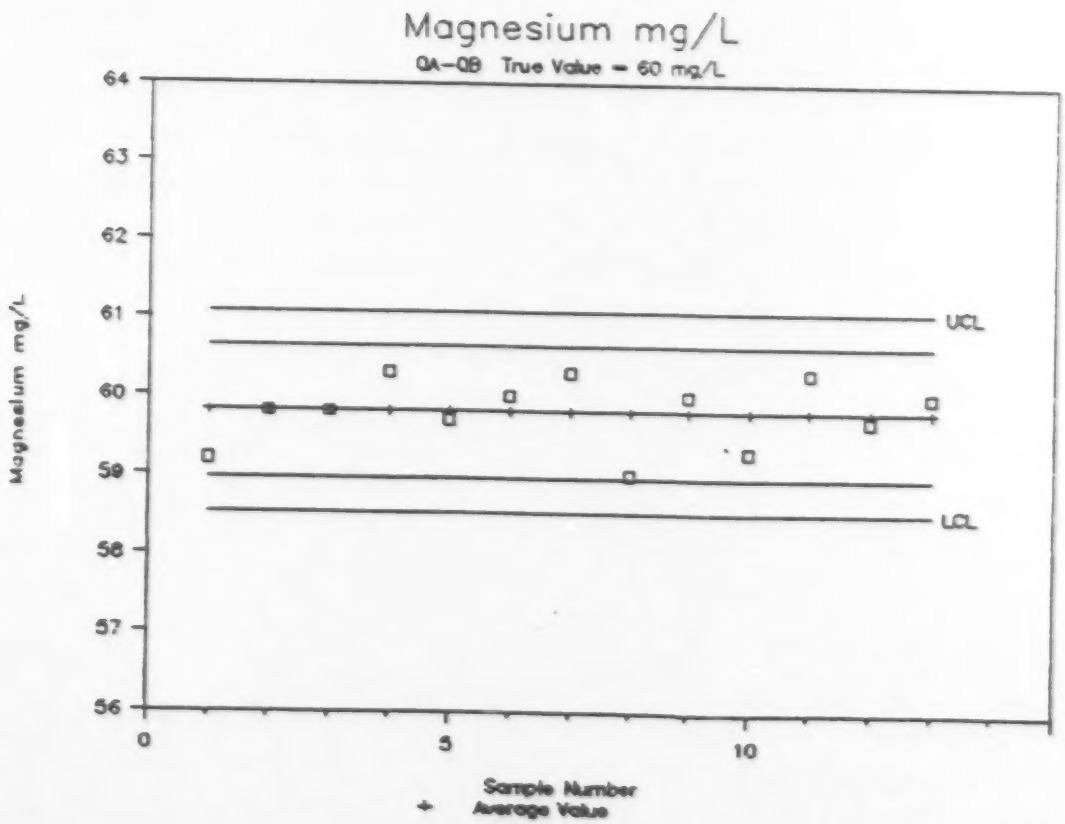

Calcium mg/L
QA+QB True Value = 100.0 mg/L
Calcium mg/L
116
114
112
110
108
106
104
102
100
98
96
94
92
90
88
86
84
UCL
LCL
0
5
10
15
Sample Number
+ Average Value

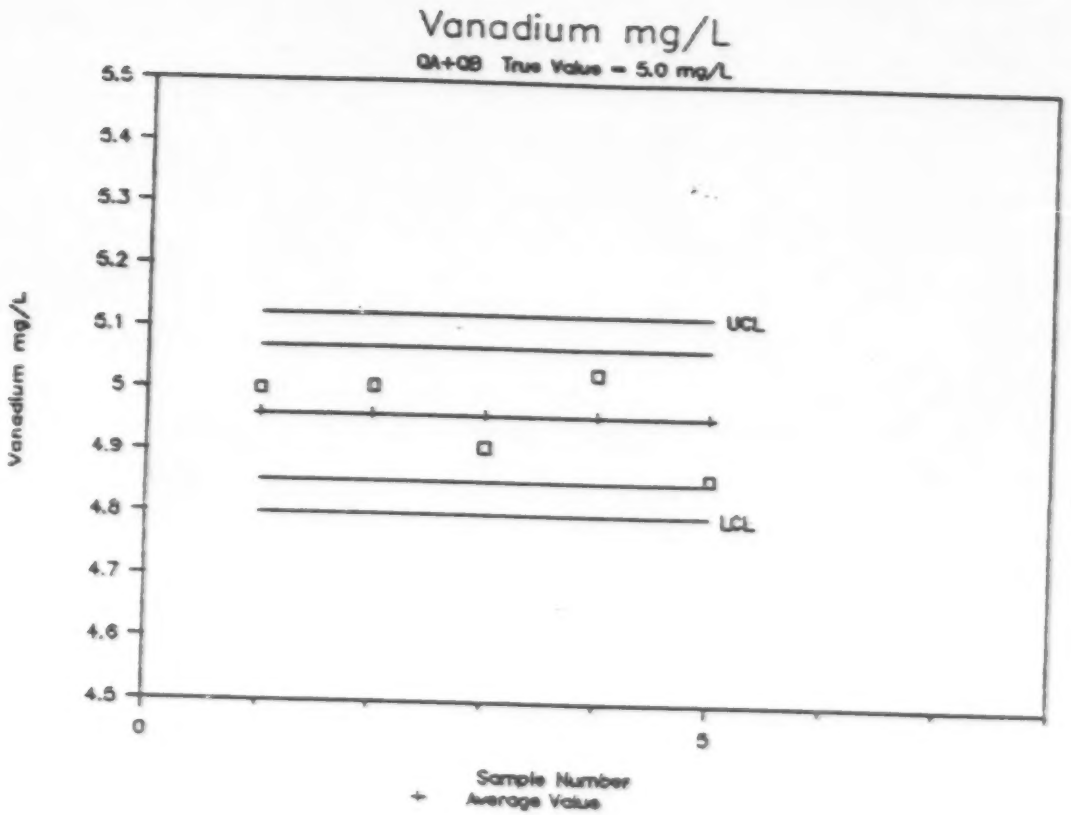

Calcium mg/L
QA-QB True Value = 60.0 mg/L
Calcium mg/L
76
74
72
70
68
66
64
62
60
58
56
54
52
50
48
46
44
UCL
LCL
0
5
10
15
Sample Number
+ Average Value

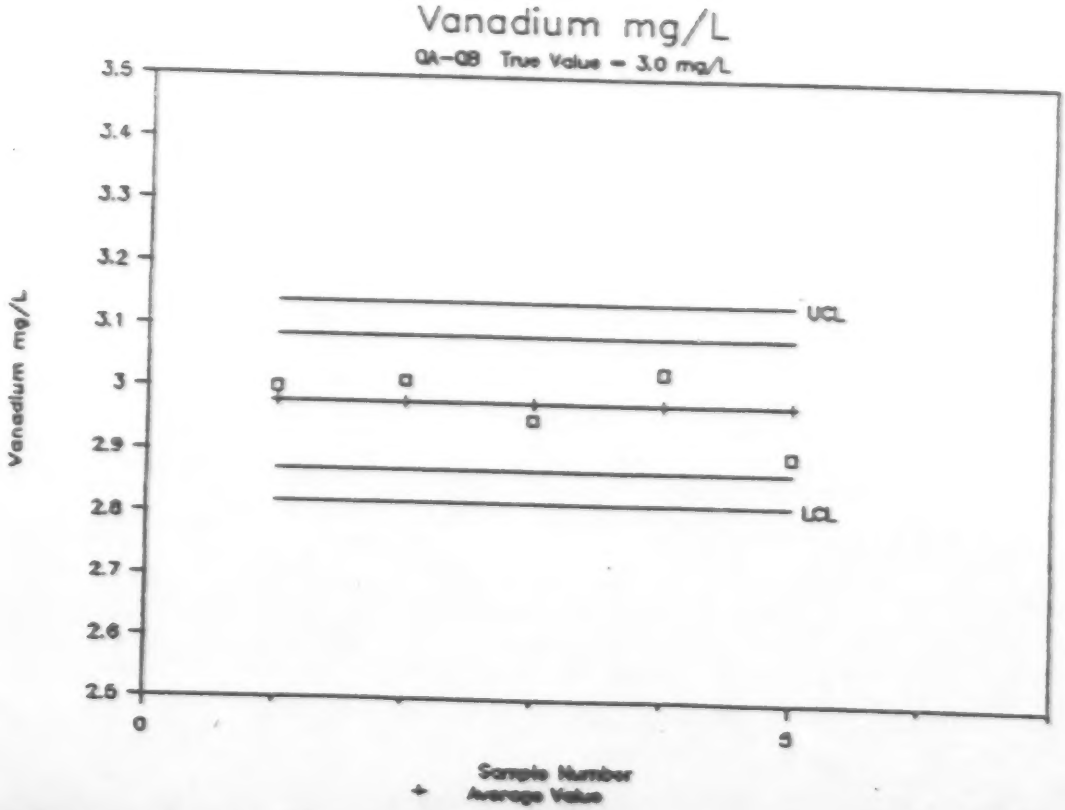

Aluminum mg/L
QA+QB True Value = 20.0 mg/L
Aluminum mg/L
23
22
21
20
19
18
UCL
LCL
0
5
10
Sample Number
Average Value

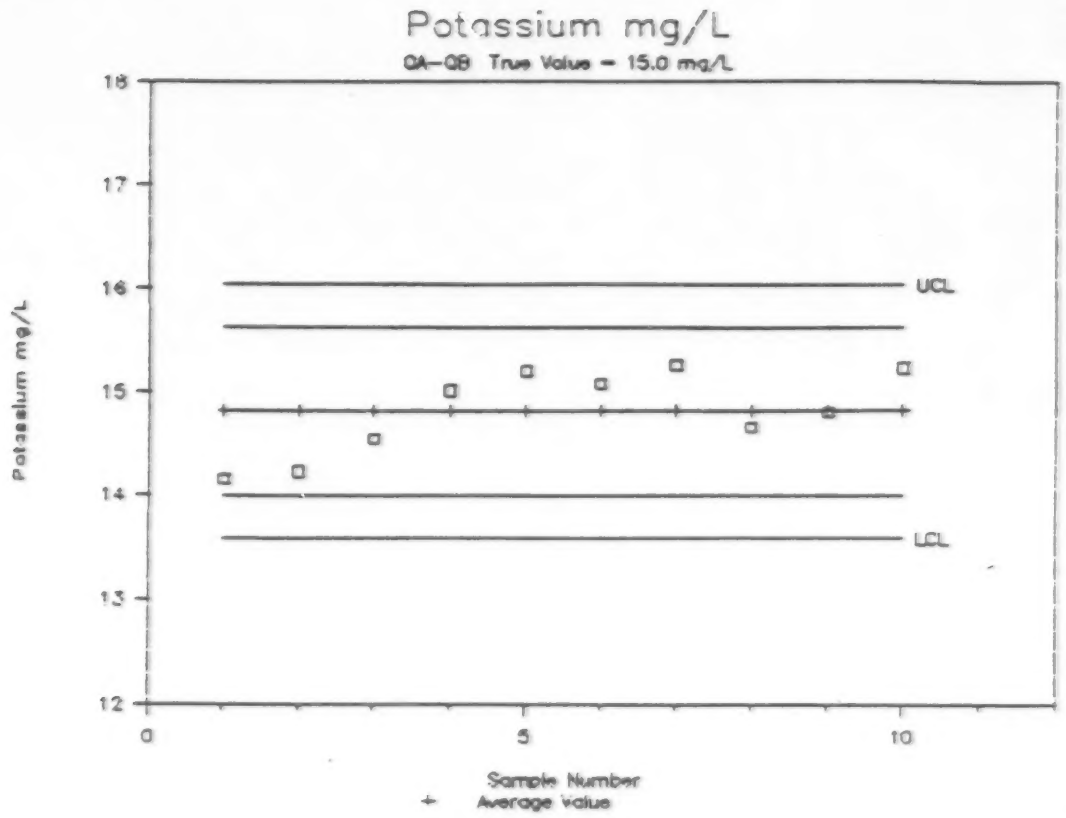

Aluminum mg/L
QA-QB True Value = 12.0 mg/L
Aluminum mg/L
14
13
12
11
10
9
UCL
LCL
0
5
10
Sample Number
Average Value

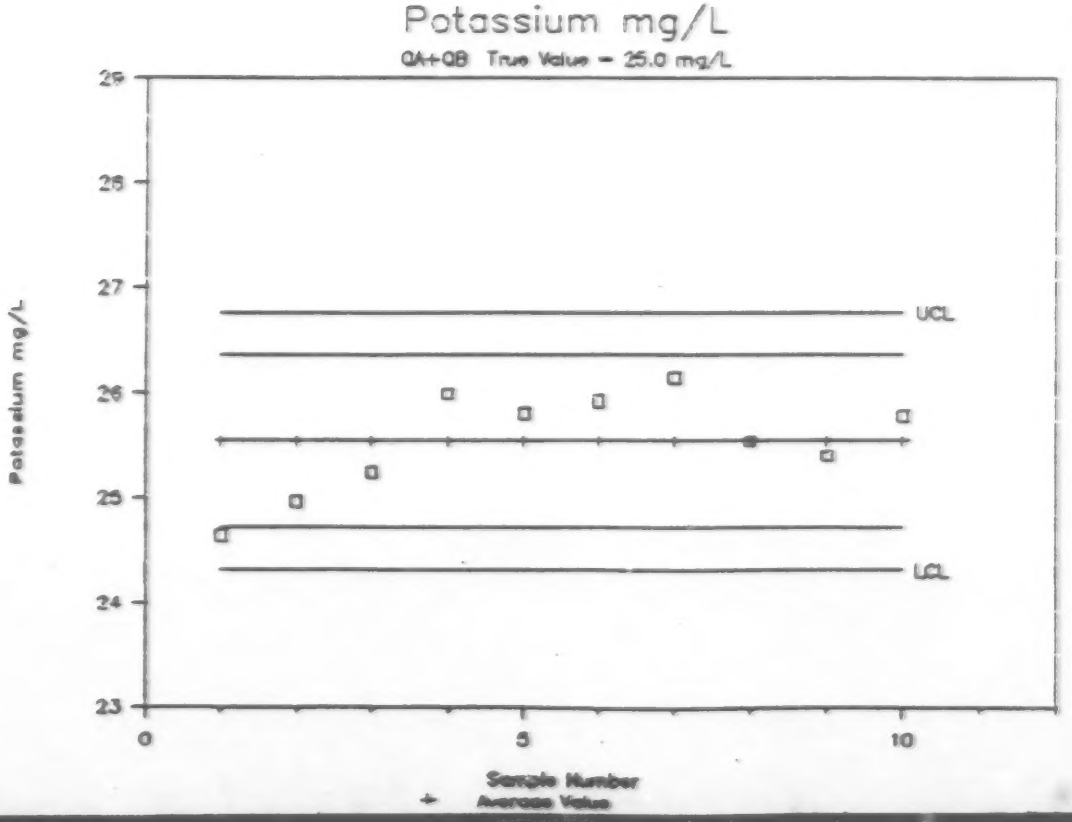

Magnesium mg/L
QA+QB True Value = 100 mg/L
Magnesium mg/L
103
102
101
100
99
98
97
96
95
UCL
LCL
0
5
10
Sample Number
Average Value

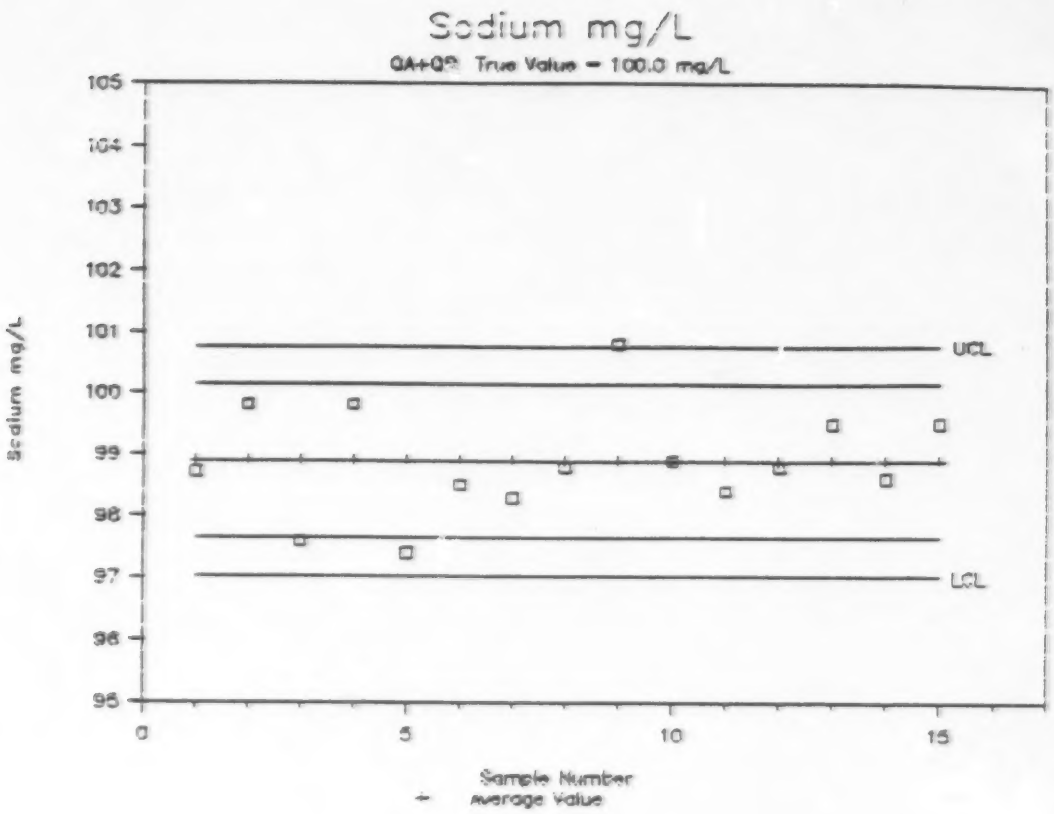

Magnesium mg/L
QA-QB True Value = 60 mg/L
Magnesium mg/L
64
63
62
61
60
59
58
57
56
UCL
LCL
0
5
10
Sample Number
Average Value

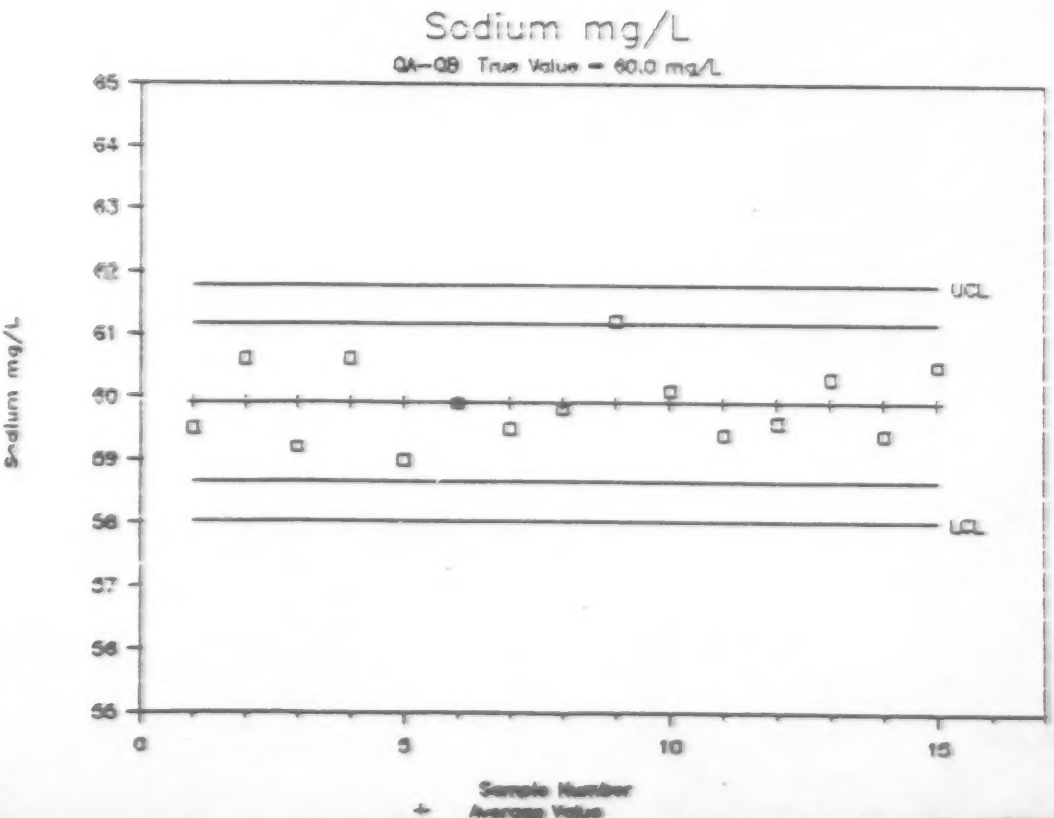

Vanadium mg/L
QA+QB True Value = 5.0 mg/L
Vanadium mg/L
5.5
5.4
5.3
5.2
5.1
5
4.9
4.8
4.7
4.6
4.5
UCL
LCL
0
5
Sample Number
Average Value

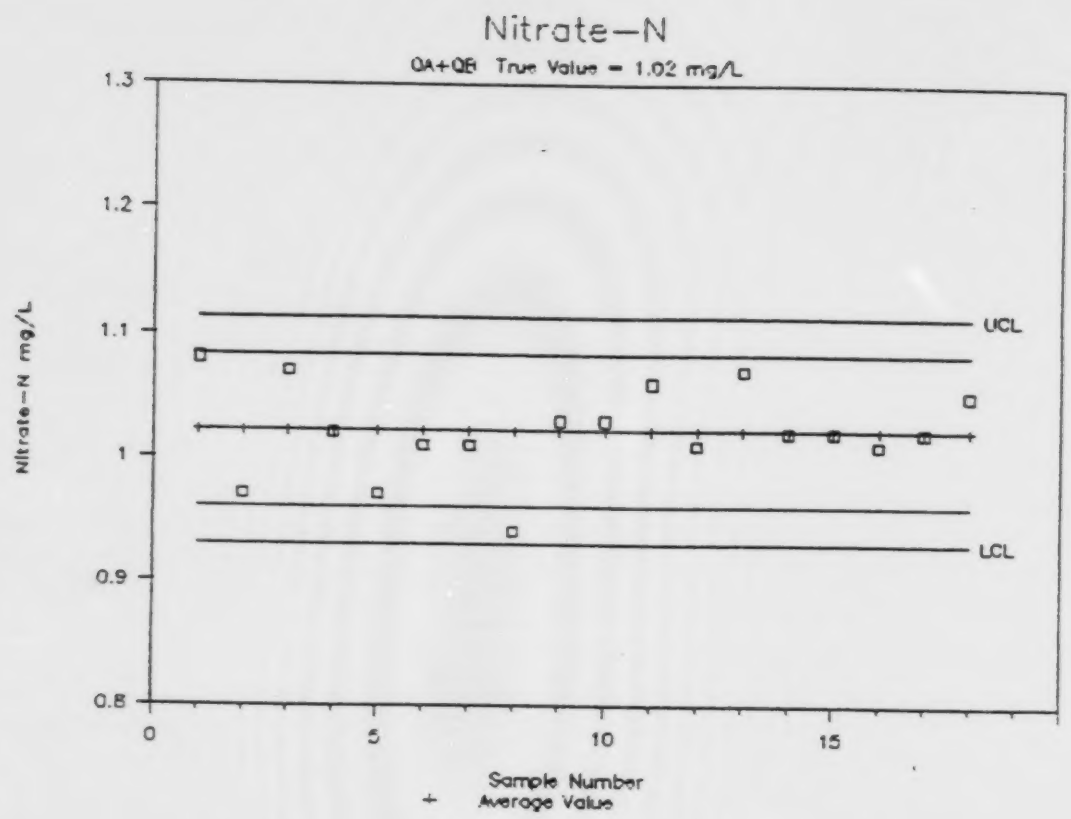

Vanadium mg/L
QA−QB True Value = 3.0 mg/L
Vanadium mg/L
3.5
3.4
3.3
3.2
3.1
3
2.9
2.8
2.7
2.6
2.5
UCL
LCL
0
5
Sample Number
Average Value

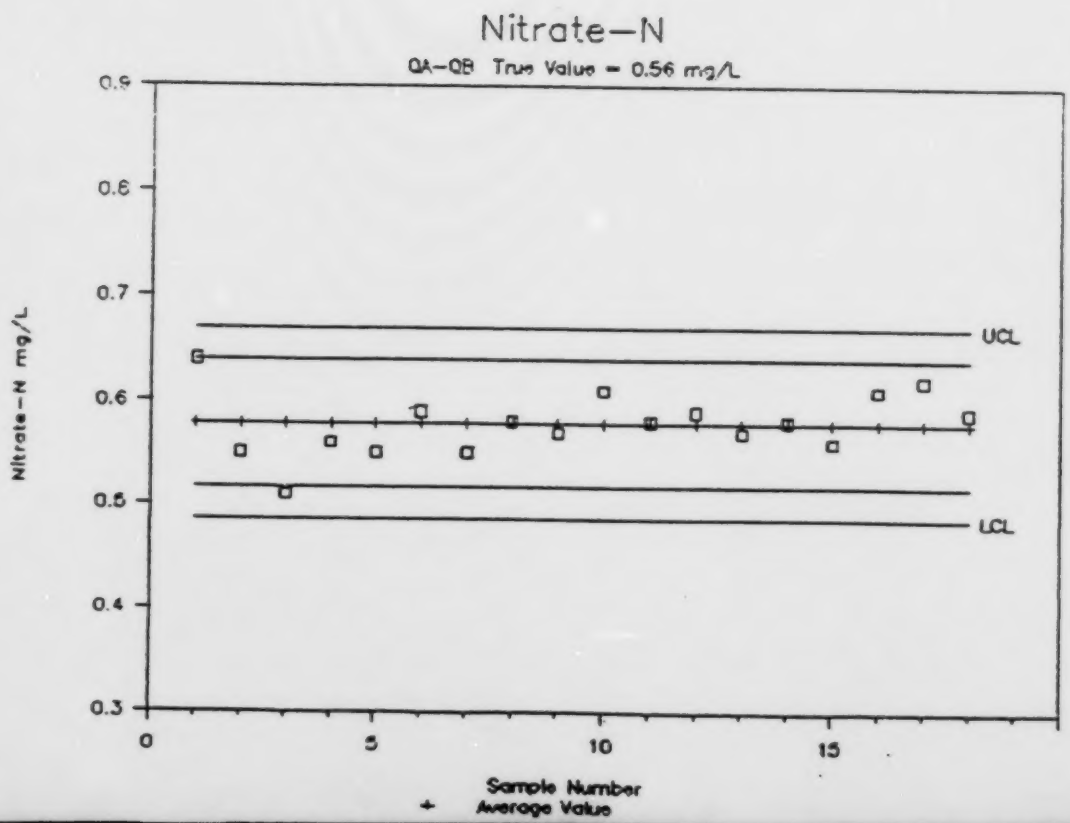

Potassium mg/L
QA-QB True Value = 15.0 mg/L
Potassium mg/L
18
17
16
15
14
13
12
UCL
LCL
0
5
10
Sample Number
Average Value

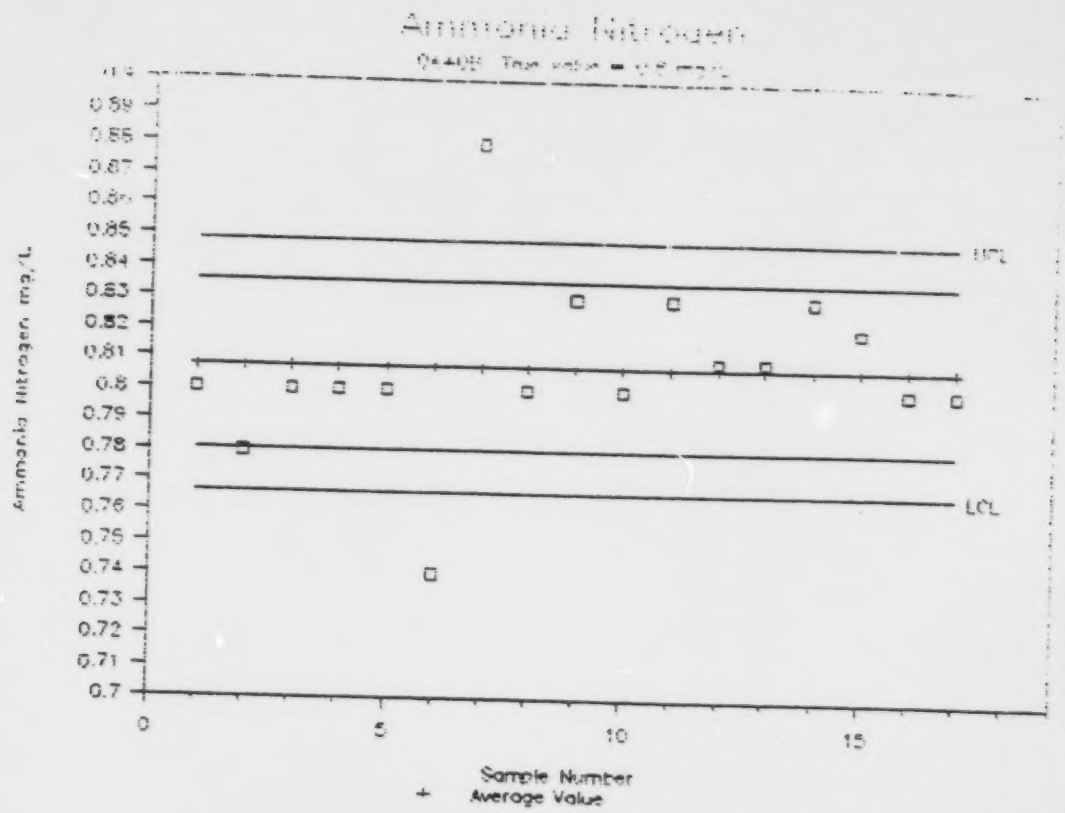

Potassium mg/L
QA+QB True Value = 25.0 mg/L
Potassium mg/L
29
28
27
26
25
24
23
UCL
LCL
0
5
10
Sample Number
Average Value

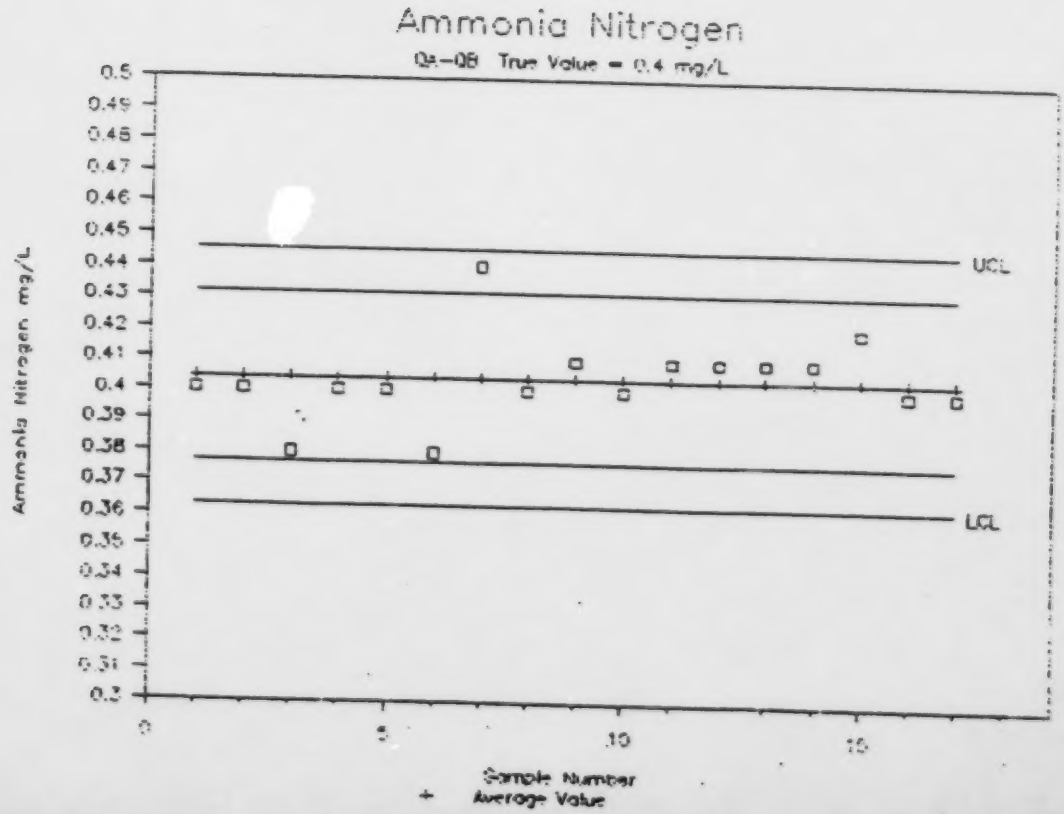

Sodium mg/L
QA+QB True Value = 100.0 mg/L
Sodium mg/L
105
104
103
102
101
100
99
98
97
96
95
UCL
LCL
0
5
10
15
Sample Number
Average Value

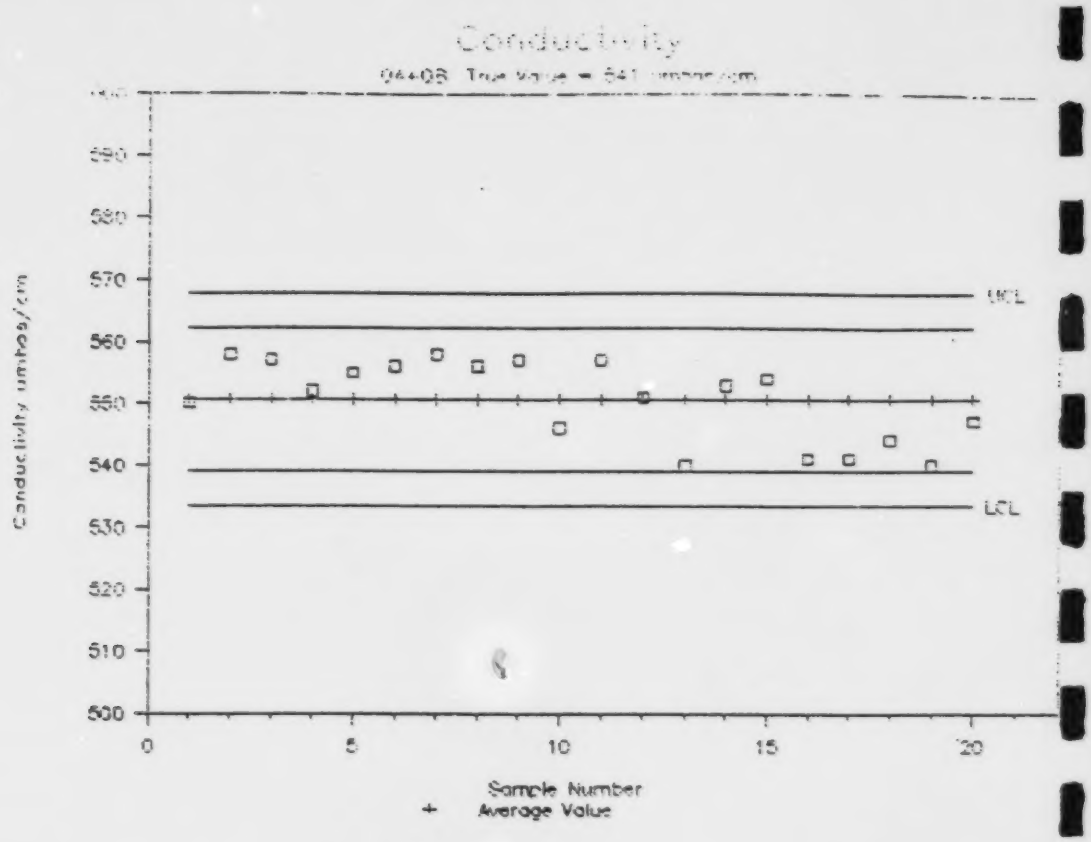

Sodium mg/L
QA−QB True Value = 60.0 mg/L
Sodium mg/L
65
64
63
62
61
60
59
58
57
56
55
UCL
LCL
0
5
10
15
Sample Number
Average Value

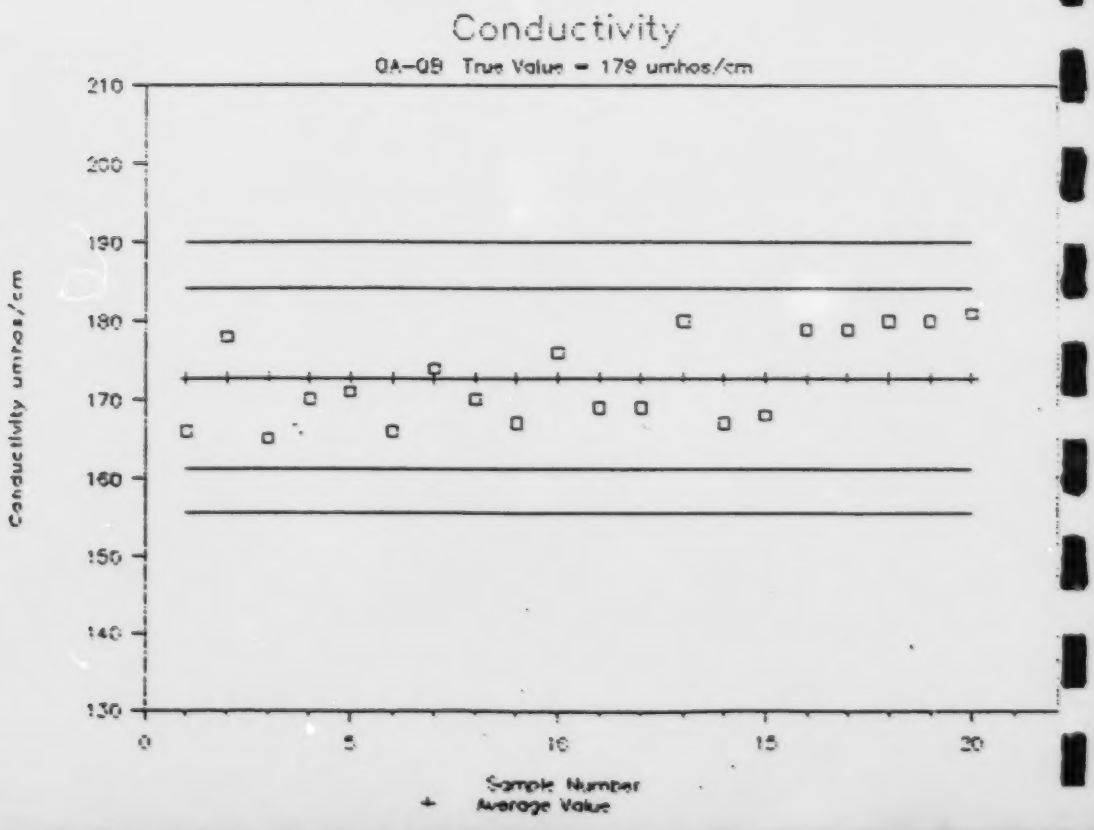

Nitrate—N
QA+QB True Value = 1.02 mg/L
1.3
1.2
1.1
1
0.9
0.8
Nitrate—N mg/L
UCL
LCL
0
5
10
15
Sample Number
+ Average Value


Nitrate—N
QA—QB True Value = 0.56 mg/L
0.9
0.8
0.7
0.6
0.5
0.4
0.3
Nitrate—N mg/L
UCL
LCL
0
5
10
15
Sample Number
+ Average Value


Ammonia Nitrogen
Ammonia Nitrogen, mg/L
UCL
LCL
Sample Number
Average Value


Ammonia Nitrogen
QA-QB True Value = 0.4 mg/L
Ammonia Nitrogen, mg/L
UCL
LCL
Sample Number
Average Value


Conductivity
Conductivity umhos/cm
590
580
570
560
550
540
530
520
510
500
UCL
LCL
0
5
10
15
20
Sample Number
Average Value


Conductivity
QA-QB True Value = 179 umhos/cm
Conductivity umhos/cm
210
200
190
180
170
160
150
140
130
0
5
10
15
20
Sample Number
Average Value

REPLICATE DATA FOR CONTROL OF
PRECISION DURING ANALYSIS OF
ALGOMA-STELCO SAMPLES

Zinc (DCP) Water
Working Range = 0.01 - 10 mg/L

<0.05 mg/L				>0.05 - <1.0 mg/L				>1.0 mg/L			
Replicates		R	D^2	Replicates		R	D^2	Replicates		R	D^2
0.04	0.037	0.003	0.000009	0.079	0.073	0.006	0.000036	7.52	7.21	0.31	0.0961
0.023	0.024	0.005	0.000025	0.223	0.225	0.002	0.000004	1.35	1.395	0.045	0.002025
0.04	0.043	0.003	0.000009	0.48	0.5	0.02	0.0004	3.2	3.1	0.1	0.01
0.012	0.013	0.001	0.000001	0.505	0.515	0.01	0.0001				
0.02	0.02	0	0	0.16	0.145	0.015	0.000225				
0.013	0.011	0.002	0.000004	0.132	0.13	0.002	0.000004				
0.028	0.034	0.006	0.000036	0.05	0.054	0.004	0.000016				
0.035	0.03	0.005	0.000025	0.072	0.07	0.002	0.000004				
				0.64	0.79	0.05	0.0025				
	Sum	0.026	0.000109		Sum	0.111	0.003289		Sum	0.455	0.108125
	Mean R	0.003125			Mean R	0.012333			Mean R	0.151666	
	S	0.002610			S	0.013517			S	0.134241	
	CL	0.010209			CL	0.040293			CL	0.495495	
	SW	0.001645			SW	0.003556			SW	0.094923	
Precision		3.872830		Precision		6.336935		Precision		3.387603	

Manganese

Manganese (DCP) Water
Working Range = 0.01 - 5 mg/L

DATE	REPLICATES		<0.1 mg/L				0.1 - 1.0 mg/L				>1.0 mg/L			
			Replicates		R	D²	Replicates		R	D²	Replicates		R	D²
871022	2.4	2.3												
871027	0.03	0.03												
871209	0.03	0.03												
871222	0.01	0.01												
871222	0.46	0.46	0.03	0.03	0	0	0.46	0.46	0	0	2.4	2.3	0.1	0.01
871222	0.02	0.02	0.03	0.03	0	0	0.33	0.34	0.01	0.0001	2.68	2.56	0.12	0.0144
880105	0.04	0.05	0.01	0.01	0	0	0.2	0.19	0.01	0.0001	1.32	1.33	0.01	0.0001
880105	0.03	0.04	0.02	0.02	0	0	0.462	0.46	0.002	0.000004	2.73	2.76	0.02	0.0009
880105	0.02	0.03	0.04	0.05	0.01	0.0001	0.37	0.36	0.01	0.0001	2.14	2.05	0.09	0.0081
880107	0.33	0.34	0.03	0.04	0.01	0.0001	0.197	0.198	0.001	0.000001	2.63	2.74	0.11	0.0121
880107	2.66	2.56	0.02	0.03	0.01	0.0001	0.11	0.109	0.001	0.000001	3.7	3.73	0.03	0.0009
880107	0.2	0.19	0.028	0.02	0.008	0.000064	0.947	0.946	0.001	0.000001	2.9	2.97	0.07	0.0049
880107	1.32	1.33	0.054	0.053	0.001	0.000001	0.84	0.79	0.05	0.0025	2.44	2.46	0.02	0.0004
880609	2.73	2.75	0.024	0.026	0.002	0.000004	0.499	0.496	0.003	0.000009	1.14	1.15	0.01	0.0001
880617	0.462	0.46					0.51	0.575	0.065	0.004225				
880617	0.028	0.02					0.63	0.51	0.02	0.0004				
880617	0.054	0.053					0.592	0.585	0.007	0.000049				
880617	2.14	2.05												
880617	10.4	10.6												
880617	0.37	0.36												
880617	2.53	2.74												
880617	0.197	0.198		Sum	0.041	0.000369		Sum	0.18	0.00749		Sum	0.59	0.0519
880802	4.97	6.9												
880802	0.11	0.109		Mean R	0.0041			Mean R	0.013846			Mean R	0.059	
880812	0.947	0.946		S	0.004295			S	0.016972			S	0.050941	
880812	0.024	0.026		CL	0.013394			CL	0.045235			CL	0.192753	
880812	0.499	0.496		SW	0.003037			SW	0.012001			SW	0.036020	
880823	0.51	0.575												
880825	3.7	3.73												
880825	0.63	0.51												
880831	2.9	2.97												
880831	5.7	5.93												
880902	2.44	2.46												
880916	1.14	1.15												
880916	0.592	0.585												
880920	7.2	6.51												
880920	7.2	6.92												

Chromium (DCP) Water
Working Range = 0.01 - 5 mg/L

<0.05				0.05 - 1.0 mg/L				>1.0 mg/L		
Replicates		R	D^2	Replicates		R	D^2	Replicates	R	D^2
0.03	0.04	0.01	0.0001	0.06	0.06	0	0			
0.03	0.04	0.01	0.0001	0.06	0.06	0	0			
0.02	0.02	0	0	0.05	0.06	0.01	0.0001			
0.02	0.03	0.01	0.0001	0.07	0.075	0.005	0.000025			
0.02	0.05	0.03	0.0009	0.07	0.05	0.02	0.0004			
0.05	0.03	0.02	0.0004	0.685	0.64	0.045	0.002025			
0.008	0.01	0.002	0.000004	0.15	0.165	0.015	0.000225			
0.013	0.016	0.003	0.000009	0.06	0.055	0.005	0.000025			
0.02	0.026	0.006	0.000036	0.118	0.115	0.003	0.000009			
0.016	0.014	0.002	0.000004	0.1	0.14	0.04	0.0016			
0.01	0.012	0.002	0.000004	0.871	0.908	0.037	0.001369			
0.011	0.012	0.001	0.000001	0.478	0.484	0.006	0.000036			
0.01	0.013	0.003	0.000009	0.147	0.156	0.009	0.000081			
0.035	0.03	0.005	0.000025							
0.049	0.047	0.002	0.000004							
0.046	0.048	0.002	0.000004							
0.028	0.027	0.001	0.000001							
0.01	0.015	0.005	0.000025							
SUM		0.114	0.001726	SUM		0.195	0.005835			
Mean R		0.00675		Mean R		0.015				
S		0.007288		S		0.015057				
CL		0.022052		CL		0.045005				
SW		0.005153		SW		0.010647				
Precision		28.96158		Precision		6.650197				

Nickel (DCP) Water
Working Range = 0.01 - 5 mg/L

<0.05				0.05 - 1.0 mg/L				>1.0 mg/L			
Replicates		R	D²	Replicates		R	D²	Replicates		R	D²
0.03	0.025	0.005	0.000025	0.055	0.035	0.02	0.0004	2.86	2.92	0.06	0.0036
0.013	0.01	0.003	0.000009	0.108	0.12	0.012	0.000144				
0.006	0.007	0.001	0.000001	0.102	0.104	0.002	0.000004				
0.007	0.008	0.001	0.000001	0.068	0.08	0.012	0.000144				
0.032	0.035	0.003	0.000009	0.212	0.15	0.062	0.003844				
0.03	0.025	0.005	0.000025	0.385	0.41	0.025	0.000625				
0.04	0.044	0.004	0.000016	0.494	0.496	0.002	0.000004				
0.015	0.012	0.003	0.000009	0.062	0.068	0.006	0.000036				
				0.156	0.158	0.002	0.000004				
SUM		0.025	0.000095	SUM		0.143	0.005205	SUM		0.06	0.0036
Mean R		0.003125		Mean R		0.015888		Mean R		0.06	
S		0.002436		S		0.017004		S		0.042426	
CL		0.010209		CL		0.061909		CL		0.19502	
SW		0.001723		SW		0.012024		SW		0.03	
Precision		11.50064		Precision		9.102657					

Calcium
Working Range = 0.05 - 100 mg/L

1.0 - 20 mg/L

Replicates		R	D^2
12.5	12.4	0.1	0.01
14.2	15.4	1.2	1.44
4.1	3.9	0.2	0.04
13.3	13.8	0.5	0.25
13.9	13.5	0.4	0.16
15.7	15.7	0	0
16.4	16.1	0.3	0.09
18.9	19.8	0.9	0.81
13.5	12.8	0.7	0.49
6.5	6.3	0.2	0.04
12.5	12.4	0.1	0.01
9.6	9.7	0.1	0.01
13.1	13.2	0.1	0.01
	Sum	4.8	3.36

Mean R 0.369230
S 0.359486
CL 1.206276
SW 0.254195

20 - 50 mg/L

Replicates		R	D^2
34	35	1	1
50	49	1	1
46	43	3	9
31	32	1	1
38	38	0	0
38	42	4	16
43	48	5	25
20	20	0	0
32	32	0	0
42	42	0	0
28	28	0	0
42	43	1	1
33	34	1	1
24	26	2	4
22	21	1	1
22	22	0	0
	Sum	20	60

Mean R 1.25
S 1.369306
CL 4.08375
SW 0.968245

50 - 100 mg/L

Replicates		R	D^2
68	68	0	0
62	59	3	9
51	53	2	4
51	51	0	0
55	55.6	0.6	0.36
63	63	0	0
97	96.5	0.5	0.25
92.8	93	0.2	0.04
80	78	2	4
84.6	87.2	2.6	6.76
	Sum	10.9	24.41

Mean R 1.09
S 1.104762
CL 3.56103
SW 0.781184

Aluminum (DCP)
Working Range = 0.05 - 20 mg/L

0.05 - 1.0 mg/L				1.0 - 5.0 mg/L				5.0 - 20 mg/L			
Replicates		R	D^2	Replicates		R	D^2	Replicates		R	D^2
0.28	0.42	0.14	0.0196	1.22	1.42	0.2	0.04	8.2	7.6	0.6	0.36
0.2	0.38	0.18	0.0324	1.52	1.58	0.06	0.0036	10.2	11.35	1.15	1.3225
0.65	0.7	0.05	0.0025	1.84	1.7	0.14	0.0196				
0.26	0.26	0	0	1.16	1.05	0.11	0.0121				
0.52	0.85	0.33	0.1089	2	2.2	0.2	0.04		Sum	1.75	1.6825
0.48	0.5	0.02	0.0004	2.9	2.9	0	0				
0.56	1.5	0.94	0.8836	1.42	1.58	0.16	0.0256		Mean R	0.875	
0.76	0.85	0.09	0.0081	1.22	1.28	0.06	0.0036		S	0.649556	
0.36	0.36	0	0	2.7	3.3	0.6	0.36		CL	2.853625	
0.62	0.62	0	0	2.1	2.1	0	0		SW	0.458596	
0.16	0.14	0.02	0.0004	1.04	1.2	0.16	0.0256				
0.48	0.48	0	0	2.5	2.66	0.06	0.0064		Precision	6.945714	
0.4	0.45	0.05	0.0025	2.23	2.28	0.05	0.0025				
0.2	0.16	0.02	0.0004	1.82	1.94	0.12	0.0144				
0.26	0.26	0	0								
0.44	0.5	0.06	0.0036		Sum	1.94	0.5534				
0.06	0.06	0	0								
0.08	0.08	0	0		Mean R	0.138571					
0.06	0.06	0	0		S	0.140585					
0.58	0.57	0.01	0.0001		CL	0.452712					
0.34	0.32	0.02	0.0004		SW	0.099406					
1	0.98	0.02	0.0004								
0.65	0.64	0.01	0.0001		Precision	7.429962					
0.86	0.4	0.46	0.2116								
0.16	0.14	0.02	0.0004								
0.08	0.08	0	0								
0.26	0.24	0.02	0.0004								
0.34	0.28	0.06	0.0036								
0.56	0.65	0.09	0.0081								
0.14	0.14	0	0								
0.256	0.222	0.035	0.001296								
0.037	0.036	0.001	0.000001								

Sum	2.647	1.236797
Mean R	0.062716	
S	0.141906	
CL	0.270242	
SW	0.100342	
Precision	35.69553	

Magnesium

Working Range = 0.05 - 100 mg/L

0.05 - 20 mg/L

Replicates		R	D²
1.8	1.9	0.1	0.01
2.9	3	0.1	0.01
9.1	10	0.9	0.81
5.1	5.2	0.1	0.01
6.6	6.7	0.1	0.01
8.3	8.5	0.2	0.04
3.1	3.1	0	0
5.6	5.6	0	0
9.1	8.5	0.6	0.36
8.4	9.6	1.2	1.44
2.9	3	0.1	0.01
4.9	5.4	0.5	0.25
7.8	7.9	0.1	0.01
3.2	3.2	0	0
3.1	3.1	0	0
5.2	5	0.2	0.04
4.4	4.2	0.2	0.04
4.7	4.6	0.1	0.01
4.7	4.7	0	0
3.7	4.3	0.6	0.36
4.6	4.6	0	0
13.9	14.3	0.4	0.16
2.8	2.9	0.1	0.01
4.3	4.2	0.1	0.01
2.2	2.2	0	0
8.7	8.6	0.1	0.01
8.9	8.7	0.2	0.04
7.4	7.2	0.2	0.04
8.4	8.4	0	0
8.2	8.3	0.1	0.01
5.9	6.4	0.5	0.25
5	5.1	0.1	0.01
5.1	5.2	0.1	0.01
1.22	1.16	0.06	0.0036
9.5	9.29	0.21	0.0441
6	5.3	0.7	0.49
13.2	12.7	0.5	0.25
	Sum	8.47	4.7477

Mean R 0.228918
S 0.253294
CL 0.747878
SW 0.179106

20 - 50%
20 - 50 mg/L

Replicates		R	D²
33	32	1	1
46	45	1	1
42.8	41.8	1	1
42.3	43.1	0.8	0.64
44.1	44.2	0.1	0.01
46.3	46	0.3	0.09
31	31.2	0.2	0.04
	Sum	4.4	3.76

Mean R 0.628571
S 0.519615
CL 2.053542
SW 0.367423

50 - 100%
50 - 100 mg/L

Replicates		R	D²
54	54	0	0
65.8	66.5	0.7	0.49
56.8	58	1.2	1.44
56.2	55.4	0.8	0.64
	Sum	2.7	2.57

Mean R 0.675
S 0.566789
CL 2.205225
SW 0.400780

Potassium (DCP)
Working Range = 0.05 - 25 mg/L

1.0 - 5.0 mg/L

Replicates		R	D²
2.4	2.5	0.1	0.01
1.4	1.8	0.4	0.16
1.7	2.2	0.5	0.25
1.7	1.75	0.05	0.0025
1.75	2.3	0.55	0.3025
1.7	1.8	0.1	0.01
4.5	4.4	0.1	0.01
1.15	1.15	0	0
1.15	1.1	0.05	0.0025
1.9	1.75	0.15	0.0225
1.04	1.02	0.02	0.0004
4.4	4.6	0.2	0.04
4.9	4.8	0.1	0.01
1.05	1	0.05	0.0025
1.7	1.7	0	0
2	2.3	0.3	0.09
1.5	1.6	0.1	0.01
1.65	1.65	0	0
3.86	4.04	0.18	0.0324
3.07	3.24	0.17	0.0289
2.78	2.69	0.09	0.0081
3.56	3.76	0.2	0.04
4.53	4.6	0.07	0.0049
3.4	3.33	0.07	0.0049
1.68	1.72	0.04	0.0016
1.05	0.95	0.1	0.01
2.88	2.83	0.05	0.0025
2.78	2.7	0.08	0.0064
	Sum	3.82	1.0626

Mean R 0.136428
S 0.137749
CL 0.445712
SW 0.097403

5.0 - 12.5 mg/L

Replicates		R	D²
5.5	6.4	0.9	0.81
6.2	8	1.8	3.24
7.4	7.3	0.1	0.01
8.5	8.8	0.3	0.09
7.7	7.85	0.15	0.0225
7.6	7.9	0.3	0.09
6.9	6.4	0.5	0.25
6.8	6.7	0.1	0.01
8	8	0	0
5.1	5.1	0	0
6.2	6.3	0.1	0.01
11.8	11.7	0.1	0.01
8.39	8.6	0.21	0.0441
5.04	4.98	0.06	0.0036
7.64	7.44	0.2	0.04
	Sum	4.82	4.6302

Mean R 0.321333
S 0.392861
CL 1.049796
SW 0.277794

12.5 - 25 mg/L

Replicates		R	D²
12.3	13.2	0.9	0.81
12.4	12.6	0.2	0.04
16	16.2	0.2	0.04
17.4	19.4	2	4
22.8	22.5	0.3	0.09
13.1	12.7	0.4	0.16
	Sum	4	5.14

Mean R 0.666666
S 0.654471
CL 2.178
SW 0.462781

Sodium (DCP)
Working Range = 0.5 - 100 mg/L

0.5 - 20 mg/L				20 - 50 mg/L				50 - 100% 50 - 100 mg/L			
Replicates		R	D^2	Replicates		R	D^2	Replicates		R	D^2
2.3	2	0.3	0.09	24	23	1	1	82	85	3	9
3.5	4	0.5	0.25	21	20	1	1	55	57	2	4
6.5	7.5	1	1	40.4	40.7			62	60	2	4
5.5	5.5	0	0	36.8	38.3			73	70	3	9
2.5	4	1.5	2.25	35	34.5			73	71	2	4
8.5	9	0.5	0.25	21.3	22.8						
9.5	9	0.5	0.25	26.1	26				Sum	12	30
10	10	0	0	30.6	29.4						
13	13	0	0	37	37.1				Mean R	2.4	
7	6.5	0.5	0.25	20.8	20.6				S	1.732050	
3.5	3.5	0	0						CL	7.8408	
2.5	2.58	0.08	0.0064						SW	1.224744	
2	1.5	0.5	0.25		Sum	2	2				
3.5	3.5	0	0								
20	19	1	1		Mean R	1					
9	8.5	0.5	0.25		S	0.707106					
12.5	13.5	1	1		CL	3.267					
14	14	0	0		SW	0.5					
9.94	10	0.06	0.0036								
9.5	9.38	0.12	0.0144								

Sum	8.06	6.8644
Mean R	0.403	
S	0.414258	
CL	1.316601	
SW	0.292924	

APPENDIX 7

Subcontractors' Reports

HYDROGEOLOGY

BY

TERRAQUA INVESTIGATIONS LTD.

JANUARY 1989

TERRAQUA INVESTIGATIONS LTD.

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HYDROGEOLOGICAL INVESTIGATION
ALGOMA STEEL CORPORATION
SLAG DISPOSAL SITE

for

Ontario Ministry of the Environment

by

TERRAQUA INVESTIGATIONS LTD.

R. Blackport

B. Boyle

Reference No. TA8873

September 1990

1.0 INTRODUCTION

The following hydrogeologic study, performed by Terraqua Investigations Ltd., focuses on the groundwater flow conditions at the Algoma Steel Slag site. The scope of work included the installation, development and water level monitoring of 34 piezometers on or adjacent to the slag dump area, the completion of response tests at each of the piezometers, and the estimation of groundwater velocity and flux in several areas of the site.

The following sections describe the study methods and the general geology and hydrostratigraphy of the Algoma Steel slag site. General results from previous hydrogeologic studies (Geocon, 1983; CRA, 1988; GLL, 1988) have been incorporated into the discussion of the results of this study.

2.0 METHODS

Details of the drilling, soil sampling and response test procedures are documented on Appendix 1; only a brief description is presented here.

2.1 DRILLING AND PIEZOMETER INSTALLATION

2.1.1 Drilling Methods and Soil Sampling

Hollow stem augering, using a CME-75 drill rig equipped with standard 10.8 cm (4 1/4 inch) inner-diameter (I.D.) augers, was employed at all but two of the boreholes drilled on-site. The required depth of penetration an difficult drilling conditions necessitated the use of the wet rotary method at locations B2-3 and A7-1.

Subsurface samples were collected using either a continuous or split-spoon sampler; where wet rotary drilling was used, cuttings were obtained using a wire-mesh sieve.

All samples were photographed and geologically logged in the field. Representative sub-samples were collected in glass jars for visual reference.

2.1.2 Piezometer Installation

A single piezometer was installed within each exploratory borehole. Nested piezometers were installed at several drilling locations, and are comprised of two or three piezometers

installed at varying depths in separate boreholes drilled within about 3 metres of one another.

All piezometers (with the exception of A7-1, which had a steel casing) were constructed from 5 cm (2-inch) I.D. schedule 40 polyvinyl chloride (PVC) casing and slotted pipe. The final configurations of the piezometers in each of the boreholes are presented in Appendix 2.

2.2 SINGLE WELL HYDRAULIC CONDUCTIVITY TESTING

Response tests were conducted at all piezometers, except A7-1, to determine the average *in situ* hydraulic conductivity of the geologic materials which are intersected by the filterpack surrounding the well screen. A7-1 was not tested as its large diameter made this impractical. The response test data were analyzed using the method of Hvorslev (1951). A description of this method is included in Appendix 1, and calculations are included in Appendix 3.

3.0 RESULTS

3.1 HYDROSTRATIGRAPHY

The regional geology of the Algoma slag site and surrounding area is illustrated schematically in Figure 3.1 (based on Geocon, 1983). The Algoma Steel slag area is underlain by a sequence of glaciolacustrine, till and granular deposits of varying thickness. Bedrock is comprised of Cambrian sandstone having extremely irregular topography beneath the site. The sediments and sandstone pinch out against the Pre-Cambrian basement rock which outcrops in the highland area to the north of Sault Ste. Marie. Bedrock occurs at a shallow depth beneath the high slag area, but drops off quickly to the north and east, and more gradually to the southwest.

Schematic cross-sections illustrating the general geology of the Algoma slag site are presented in Figures 3.2 and 3.3. A full suite of detailed geologic sections are included in Appendix 8. The geologic material beneath the slag area can be divided into six distinct and significant hydrostratigraphic units, as follows:

1) **slag material**
2) **shallow sand and gravel**
3) laminated **clay and silt**
4) **silty sand till**
5) **basal sand and gravel**, and fractured/weathered sandstone

and 6) competent sandstone **bedrock**

A brief description of the units is given below; a more detailed description is included in Appendix 2.

Bedrock is comprised of a dense red and white feldspathic sandstone, which serves as a regional high capacity aquifer. The upper metre of the sandstone is brittle, highly fractured and permeable as a result of weathering during pre-glacial exposure. A bedrock structural high is located in the centre of the site, near piezometers C2 and C3 (Figure 3.4). This high appears to have controlled further deposition and shallow groundwater flow (as described in subsequent sections). Large sandstone boulders were encountered above the erosional surface of the Cambrian bedrock.

A clean, coarse **basal sand and gravel** overlies the weathered bedrock surface in the eastern area of the site (Figures 3.2 and 3.3). This sand and gravel is multi-coloured, semi-rounded, and is overlain by a fine- to coarse-grained brown sand and gravel. These basal granular units are up to 20 metres thick and appear to be quite permeable, so are quite likely to by hydraulically connected to the weathered sandstone.

To the west of the bedrock high, a dense, red, pebbly to stony **silty sand till** overlies the bedrock and thickens toward the southwest (Figures 3.2 and 3.3). A red silty sand unit flanks the eastern edge of the bedrock high, but it is less till-like (i.e., it may be a hydraulically re-worked till) than the unit to the

west. The silty sand thickens toward the bedrock valley, but is not present within the valley itself.

Glaciolacustrine **clay and silt** were encountered in all boreholes to the northeast of the line indicated on Figure 3.4, which corresponds closely to the perceived bedrock topographical high. This unit is 15 to 20 metres thick to the north of the site and pinches out beneath the slag dump. The unit is comprised of laminater, cohesive red clay and brown silt deposited during the late Algonquin and post-Algonquin. The top of the unit slopes gently to the northeast.

A brown **sand and gravel** unit up to 4 metres thick was found beneath the slag at many drilling locations, particularly those areas inland of the original shoreline, but away from the bedrock high near the centre of the slag dump area (Figure 3.4). This unit tends to be silty to the west of the bedrock high, and relatively clean to the east. The sand appears to be fluvial and may have been deposited by Spring, Bennett and West Davignon Creeks prior to construction of the diversion channels.

The uppermost unit is generally comprised of slag material which varies in grain size from very large boulders to very coarse sand. The finer component is generally located at the base of the slag deposit.

Figure 3.4 illustrates the ground surface topography prior to the disposal of the slag. A topographic high (which corresponds with the bedrock high) is located in the vicinity of piezometer C2.

3.2 GROUNDWATER FLOW SYSTEM CONDITIONS

3.2.1 Groundwater Flow Directions

Regional groundwater flow is from the north toward the St. Marys River in the south (Geocon, 1983). Groundwater is recharged via the exposed and fractured bedrock of the highlands and moves to discharge in the St. Marys River.

The configuration of the water table at the slag site, as presented in Figure 3.5, is generally controlled by the relief of the original ground surface (compare to Figure 3.4). The water table is 0.5 to 2 metres above the original ground surface inland of the former shoreline. Shallow groundwater flow occurs radially outwards from the original topographic high. On the eastern half of the site, the water table slopes gradually in a southeastern direction (Figure 3.5) toward St. Marys River, approximating the original ground surface contours to the original shoreline. At Baseline Road (i.e., boreholes A3 and A4), the water levels indicate that shallow groundwater flows in an easterly and slight northerly direction, as it appears to be controlled by the ditch along Baseline Road. Water levels monitored within the western half of the site show shallow groundwater flow to be towards Leigh Bay and the West Davignon Diversion Ditch (Figure 3.5). The schematic cross-sections also illustrate the directions of groundwater flow (Figures 3.2 and 3.3).

3.2.2 Recharge/Discharge Areas

Regional recharge to the bedrock and basal granular aquifers takes place mainly in the highland area to the north of the city, where Pre-Cambrian bedrock is exposed. The major zone of regional groundwater discharge is St. Mary's River.

Upward vertical hydraulic gradients, indicating predominantly discharge conditions across the study area, exist at all piezometer locations except A1 (Table 3.1). The upward hydraulic upgradients vary from about 0.009 to 0.12 metres/metre, with the lowest gradient occurring along the edge of the slag shoreline and the highest gradient at A2, just southwest of the limit of laminated clay and silt.

Piezometer A1 is situated between the oil pond and the pickling liquor disposal area, in a valley in the permeable slag material. Large volumes of water pickling liquor (38,000 litres/day) and oily water (280,000 litres/month) are disposed of here, thus this area constitutes a local groundwater recharge zone. Although precipitation infiltrates across most of the site, the high hydraulic conductivity of the slag results in the relatively rapid horizontal movement of groundwater, such that recharge conditions are not apparent over the other areas of the slag site.

Local discharge zones in the slag disposal area appear to include:

1) the Baseline ditch and Spring Creek, which receive shallow groundwater flow from the topographic high to the south and from the gently sloping slag/fill area to the north;

2) the West Davignon Diversion Channel, which drains the eastern part of the slag/fill area north of Baseline Road;

3) the Bennett Creek Diversion Channel, which receives recharge from the western face of the topographic high;

and 4) the St. Marys River which drains the southern face of the topographic high and the area to the south of Spring Creek.

3.2.3 Estimated Groundwater Fluxes

The flux of groundwater leaving the Algoma site has been calculated by estimating the lateral groundwater flow beneath the site. Groundwater flow in the porous geologic materials may be estimated using the Darcy equation:

$$q = KIA$$

where q = groundwater flux per unit cross-sectional area (L^3/T)

K = horizontal hydraulic conductivity (L/T)

I = horizontal hydraulic gradient (L/L)

A = cross-sectional area (L^2).

Area is equivalent to the length of the perimeter of the slag site multiplied by the thickness of the geologic unit through

which flow occurs. Hydraulic conductivities and gradients were obtained from analysis of response tests and water level data, respectively.

A summary of average horizontal hydraulic conductivity values is presented in Table 3.2. Response tests could not be conducted successfully at piezometers which were screened within the coarse slag material (generally those located along the present shoreline) as the slag was sufficiently permeable to prevent a measurable water level decline. However, the hydraulic conductivity of this material is expected to be on the order of at least 5×10^{-4} m/s, which is consistent with values given for clean sand by Freeze and Cherry (1979). The hydraulic conductivity of the slag unit is one to four orders of magnitude higher than the values calculated for the till, clay, and silty sand and gravel.

Flux through the slag would be one to four orders of magnitude greater than the flux through the less permeable underlying material, under similar lateral hydraulic gradients and assuming similar thicknesses. If there were one order of magnitude difference in hydraulic conductivities, then 90% of water would move horizontally through the slag, and only 10% would occur in the underlying material. If there were two orders of magnitude difference, 99% of the total flux would occur through the slag. In other words, the slag will transmit almost all of the groundwater laterally because the most permeable horizontal unit controls the water flux due to lateral (horizontal) gradients

present in the unit. This is true even when the more permeable unit is thinner than the less permeable layers.

Only the slag unit is considered for the purpose of the flux calculation, as most of the water movement off-site will occur in this unit. The thickness of saturated slag is estimated to be about 2 to 2.5 metres, which is the maximum height of the water table above the original ground surface.

In order to estimate the shallow groundwater flux from the slag dump to the various zones of local discharge, the study area was partitioned into five segments, as indicated in Figure 3.6. The boundaries of the segments were based on areas having fairly uniform flow directions (Figure 3.5) and average horizontal hydraulic gradients, with the flux boundaries being perpendicular to flow direction. Horizontal gradients were estimated using water level data from October 4, 1988.

Detailed calculations of flux are provided in Appendix 8 and are summarized in Table 3.3. Groundwater flux through the slag to each of the St. Marys River, West Davignon Diversion Channel, Baseline Road ditch and Bennett Creek is on the order of 10^5 to 10^6 m^3/year. These calculations are based exclusively on observed gradients and hydraulic conductivities at the slag site, and do not include any estimate of recharge or source for this water.

Annual recharge volumes over the selected area were calculated using an infiltration rate of 0.4 metres/year for comparison

with the groundwater fluxes. Disposal of pickling liquor and oily water would contribute a recharge of about 1.3×10^{4} m/year. Although locally significant, this recharge is insignificant compared to infiltration across the site.

Uncertainties and possible sources of error in the above calculations include:

- the estimate of the hydraulic conductivity of the slag, which may be highly variable across the site (± one order of magnitude);
- the horizontal hydraulic gradients, which are subject to fluctuations due to river level changes and on-site effluent disposal (± 10%);
- the cross-sectional and plan-view areas, which were approximated from Figure 3.11 by using simple geometric slopes (± 20%); and,
- the annual infiltration rates, which are also highly variable (± 50%).

Despite the uncertainties, however, the estimates of groundwater flow through the slag appear to be reasonable. Within areas D and E, there are slightly larger discrepancies between the calculated flux and the estimated recharge than in the other areas. This may be because a significant flux component exists in the shallow sand and gravel unit which underlies the slag.

Groundwater flow values provide better estimates of off-site movement than infiltration fluxes, because both infiltration and regional discharge components of flux are incorporated into the

estimation procedure by using the total volume of water moving in the groundwater regime. Discharge from the deep flow system is directly evident at the creek bed mini-piezometer sites and indirectly evident at Spring Creek, which exists only because of groundwater discharge. The slag serves to drain both shallow infiltrating water and discharge from the deeper system.

3.2.4 Groundwater Velocities and Residence Times

The average linear velocity (v) of groundwater flow from the central (high) slag area to the West Davignon Diversion Channel and St. Marys River in the slag, till and silty sand deposits can be estimated using the relationship:

$$v = \frac{Ki}{n}$$

where K = Hydraulic Conductivity (L/T)
i = Horizontal Hydraulic Gradient (L/L)
n = Porosity (L^3/L^3)

The residence times for groundwater originating in the centre of the slag disposal area, using these velocities, range from 1 to 3 years in the slag, 130 to 160 years in the silty sand, and 850 to 1200 years in the till. The most variable parameter in this calculation is the hydraulic conductivity, which could realistically be one order of magnitude higher or lower than the value assumed above, which would accordingly decrease or increase the residence times by a factor of 10.

4.0 SUMMARY

The results of the hydrogeological study of the slag area are consistent with the original hypothesis which was developed at the outset of this investigation.

Inland of the original shoreline, the water table is controlled by the topography of the original ground surface and is not mounded up in the slag. Within the slag, south of the original shoreline, the water table is governed by the level of the St. Mary's River. Regionally, groundwater flows toward the south/southeast.

Infiltration occurs locally across the site; however, the high horizontal groundwater flux through the coarse slag to the river and surrounding creeks prevents mounding of the water table, and recharge conditions are not apparent. Upward hydraulic gradients exist in the native overburden across much of the site; groundwater from the deeper units discharges to the base of the slag area and migrates through the slag to the river.

TABLES

TABLE 3.1: VERTICAL HYDRAULIC GRADIENTS AT THE ALGOMA SLAG SITE

Piezometer Nest Location	Vertical Hydraulic Gradient	
	04 October 1988	18, 19 October 1988
A1	-0.0043	-0.0057
A2	+0.13	+0.12
A4	+0.068	+0.019
A7	+0.047	+0.046
B2	+0.053	+0.058
B4	+0.041	+0.040
C2	N/A	N/A
D1	+0.0096	+0.0084
D3	+0.018	N/A
D5	+0.026	+0.024

N/A - Vertical hydraulic gradients not available because:
- o C2-2 was dry, and
- o water level data at D3 were not obtained.

'+' - upward directed gradient.

'-' - downward directed gradient.

TABLE 3.2: SUMMARY OF HYDRAULIC CONDUCTIVITIES, ALGOMA SLAG SITE

Hydrostratigraphic Unit	Hydraulic Conductivity (m/s)	
	Range	Average
Slag		5.0×10^{-4}*
Shallow Sand and Gravel	1.2×10^{-6} - 1.6×10^{-4}	2.3×10^{-5}
Till	4.6×10^{-8} - 4.1×10^{-7}	1.7×10^{-7}
Laminated Clay and Silt	5.1×10^{-8} - 4.2×10^{-7}	2.3×10^{-7}
Basal Sand and Gravel	7.6×10^{-7} - 1.0×10^{-5}	3.4×10^{-6}
Bedrock	-	6.2×10^{-9}

* Estimated conservative value.

TABLE 3.3: SUMMARY OF FLUX AND RECHARGE CALCULATIONS

Area	Hydraulic Conductivity K (m/s)	Horizontal Gradient I (/)	Vertical X-Sectional Area A (m^2)	Flux q (m^3/year)
Estimated Groundwater Flux				
A	$5x10^{-4}$	0.008	5,529	$7.0x10^5$
B	$5x10^{-4}$	0.005	2,600	$2.0x10^5$
C	$5x10^{-4}$	0.008	3,630	$4.6x10^5$
D	$5x10^{-4}$	0.003	5,363	$2.5x10^5$
E	$5x10^{-4}$	0.002	2,580	$8.1x10^4$
TOTAL GROUNDWATER FLUX				$1.7x10^6$

Estimated Recharge

Area	Plan Area A (m^2)	Annual Infiltration I (m/year)	Recharge R (m^3/year)
A	1,216,425	0.4	$4.9x10^5$
B	469,000	0.4	$1.9x10^5$
C	1,114,574	0.4	$4.4x10^5$
D	998,250	0.4	$4.0x10^5$
E	380,545	0.4	$1.5x10^5$
TOTAL ANNUAL RECHARGE			$1.6x10^6$

Estimated Total Groundwater Flux

	Flux q (m^3/year)
To St. Marys River	$1.1x10^6$
To West Davignon Diversion	$1.6x10^5$
To Baseline Ditch	$4.8x10^5$
To Bennett Creek	$8.5x10^4$

FIGURES

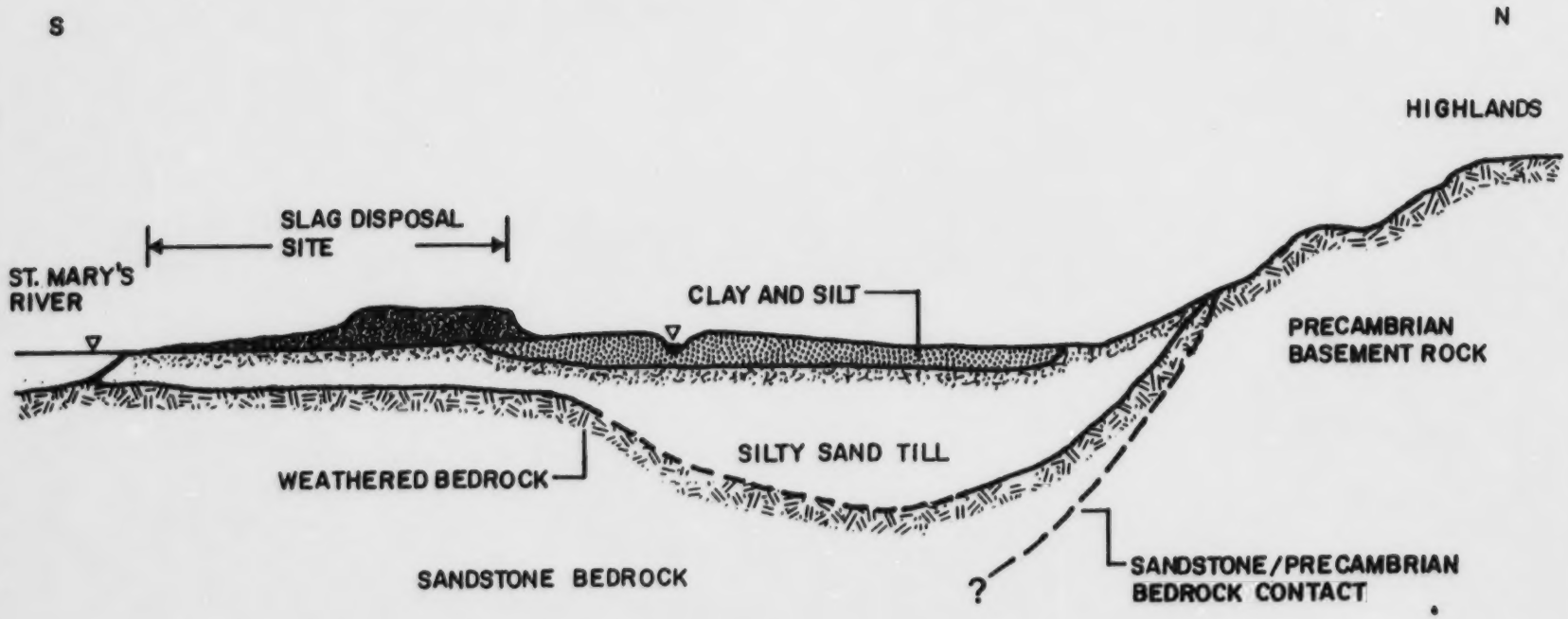


FIGURE 3.1 SCHEMATIC GEOLOGIC CROSS-SECTION

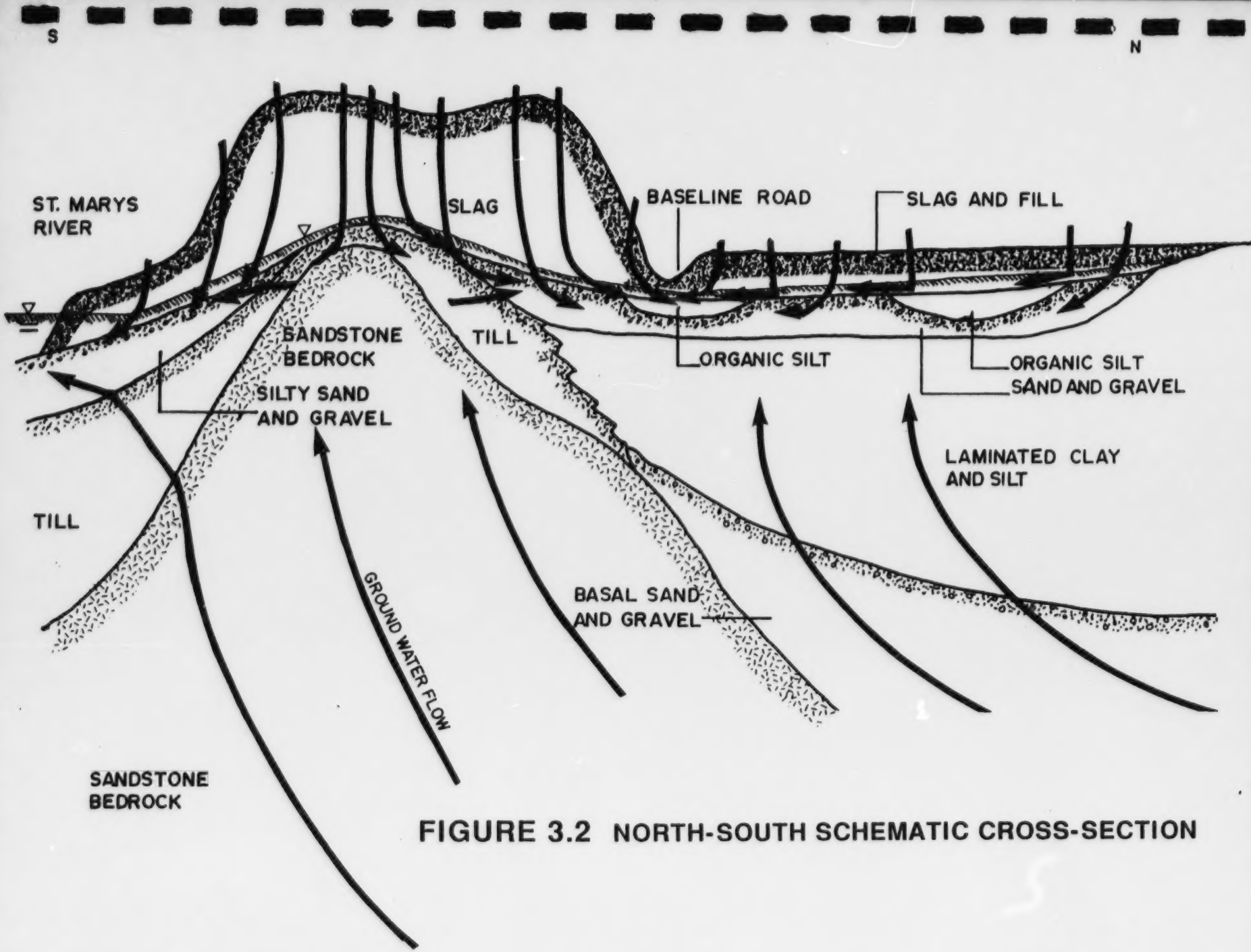


FIGURE 3.2 NORTH-SOUTH SCHEMATIC CROSS-SECTION

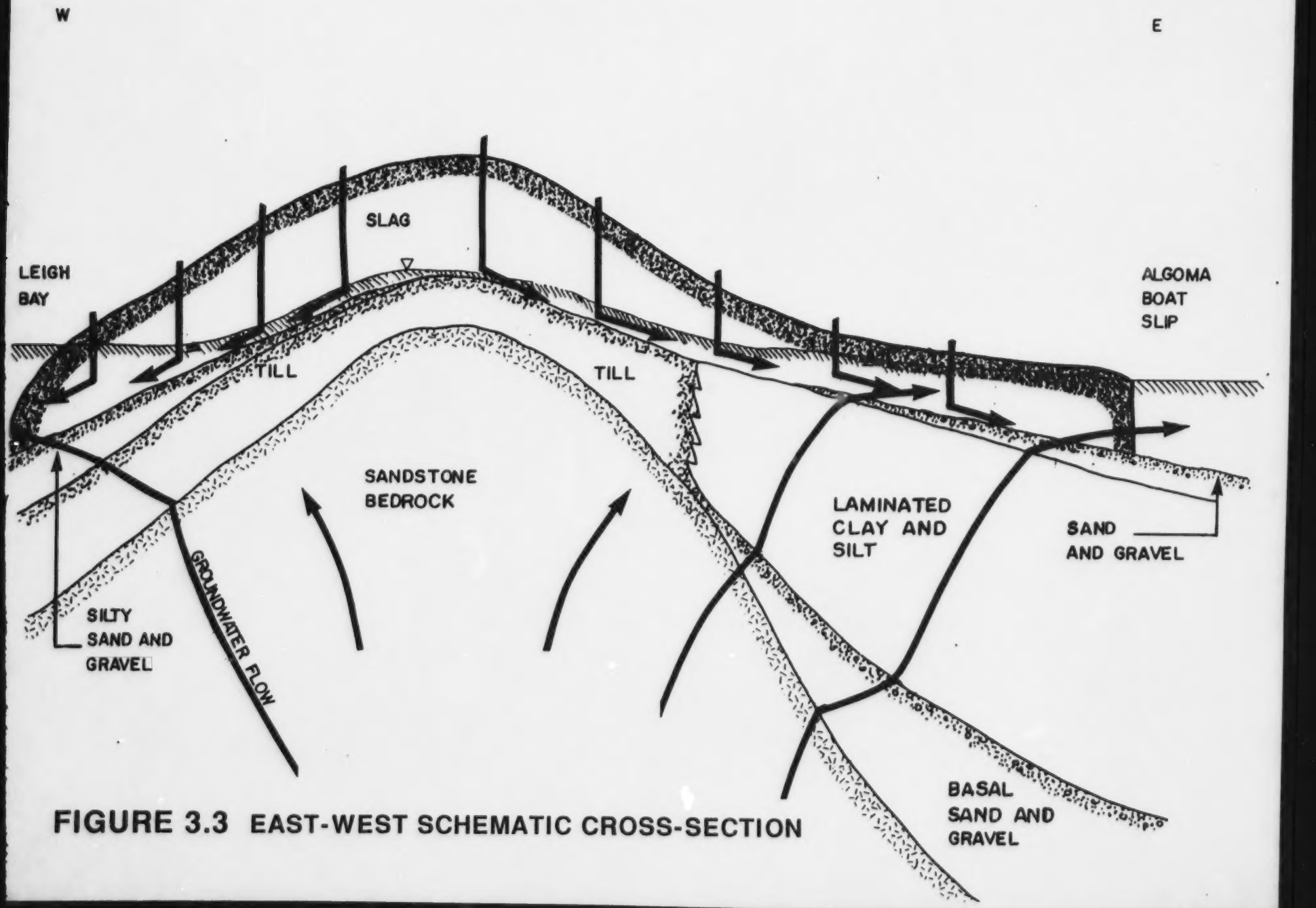


FIGURE 3.3 EAST-WEST SCHEMATIC CROSS-SECTION

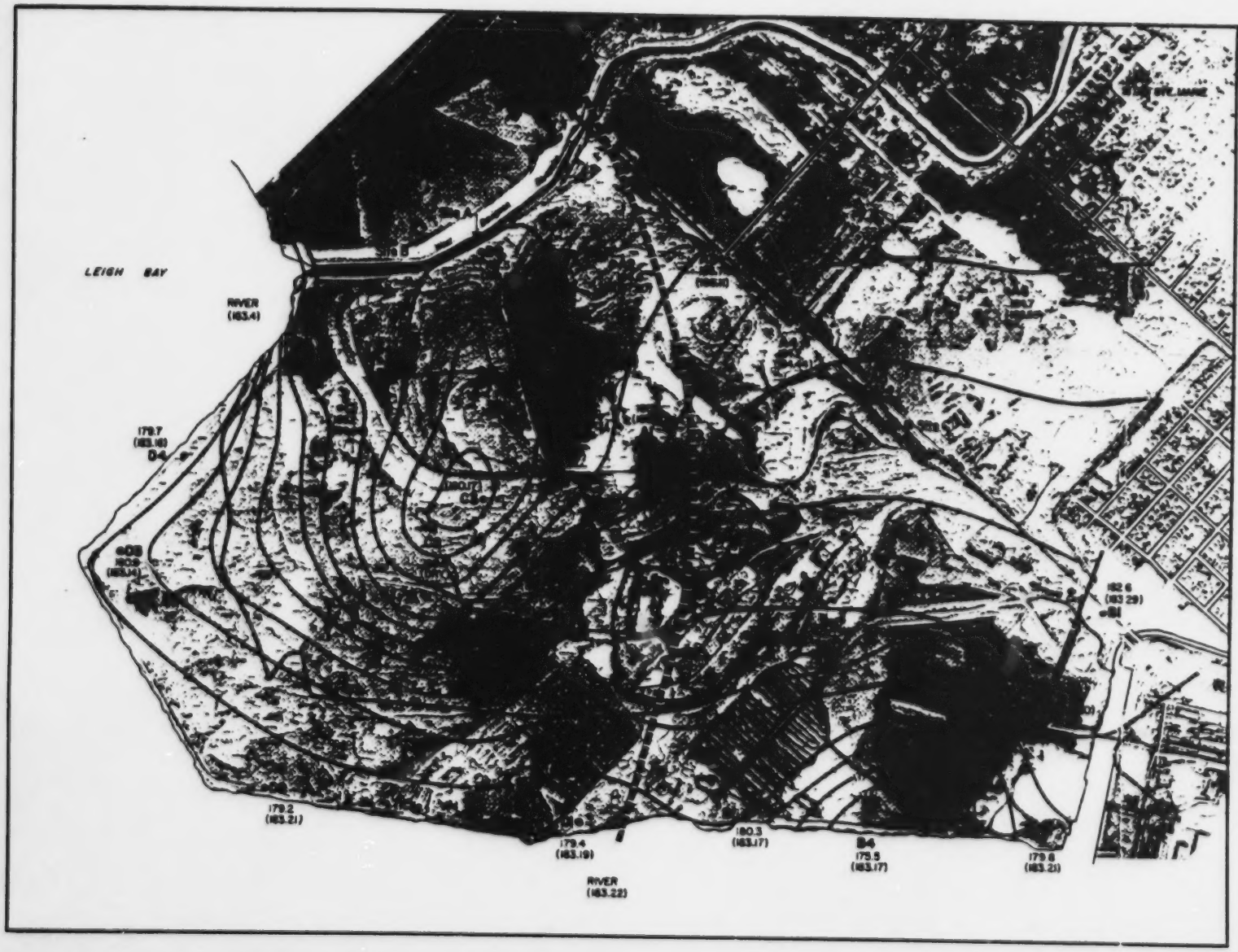


FIGURE 3.4

Original Ground Surface Topography

- ⊙ nested monitors
- ● individual monitors
- ■ creek bed mini-piezometers
- 184.7 origional ground surface elevations
- (187.1) shallow water level (88/10/0-
- ——— approximate location of original shoreline
- ▬▬ western edge of laminated silt and clay unit

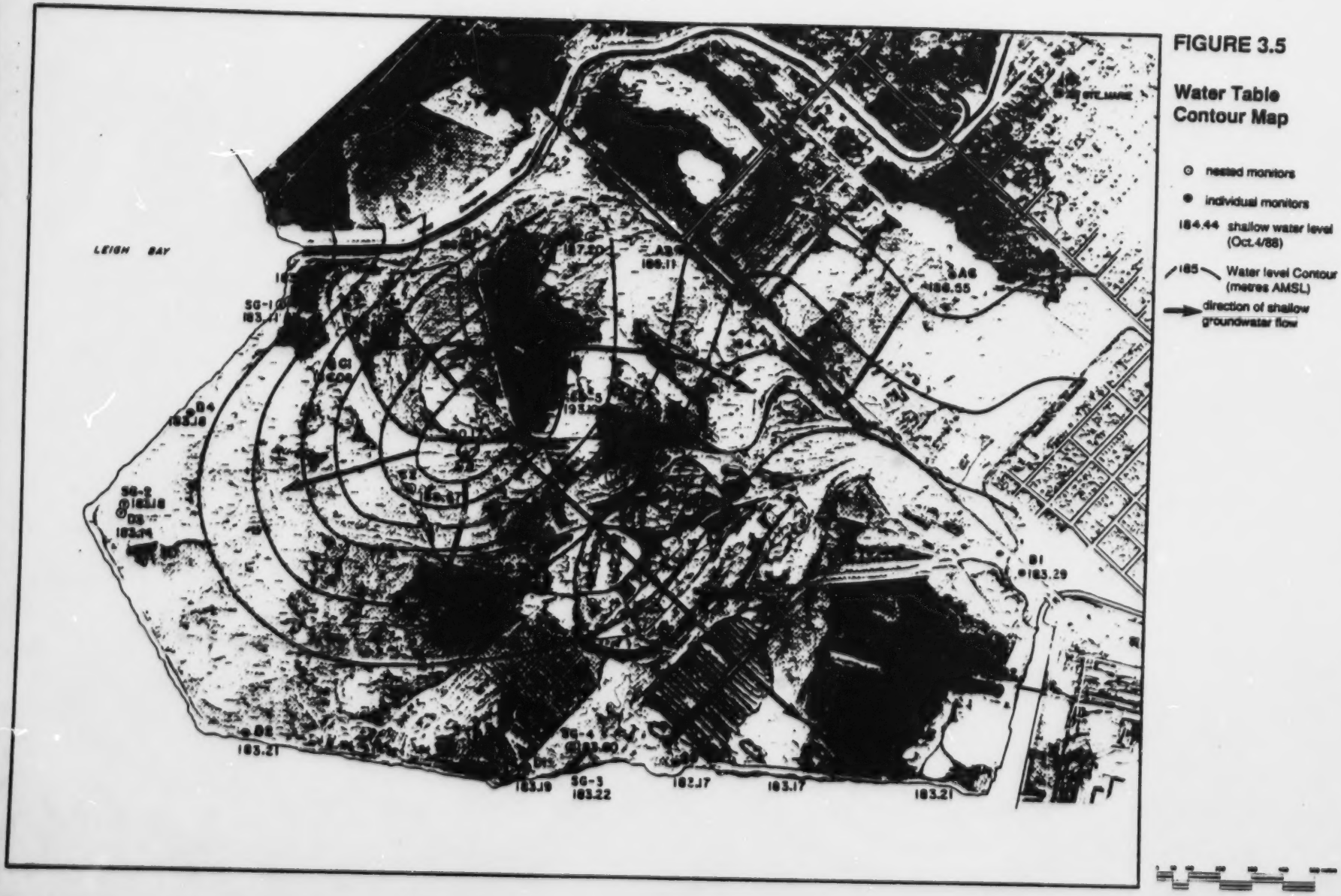


FIGURE 3.5

Water Table Contour Map

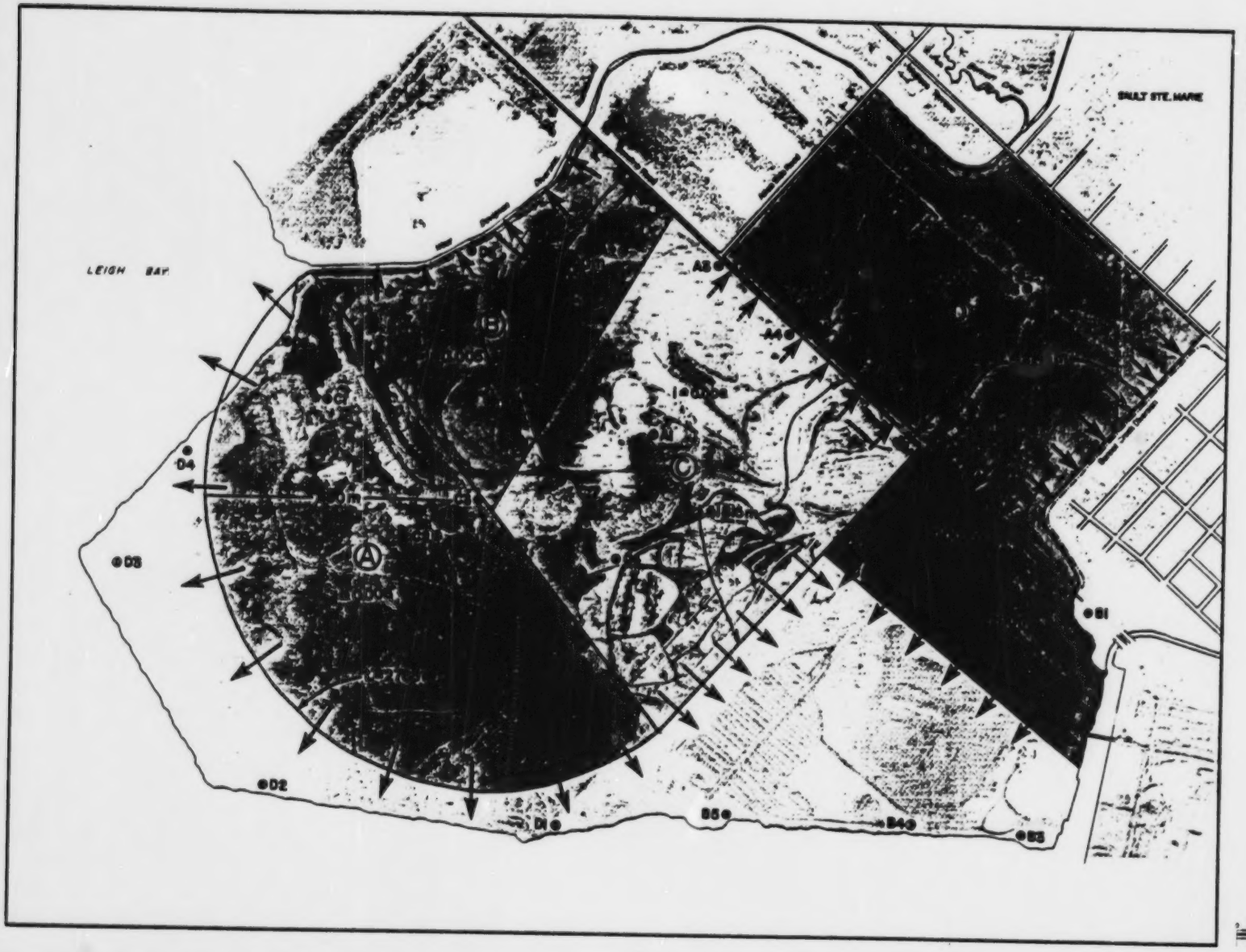


FIGURE 3.6

Partitioned Areas for Flux Calculations

⊙ nested monitors
● individual monitors

Ⓐ area

i_A average horizontal hydraulic gradient

L_A length of flux boundary (approx)

APPENDIX

FIGURE A8.1

Present Ground Surface Elevation

- ⊙ nested monitors
- ● individual monitors

note:
ground surface elevation rounded up to nearest 5 cm (metres)

( ) thickness of slag or fill in metres

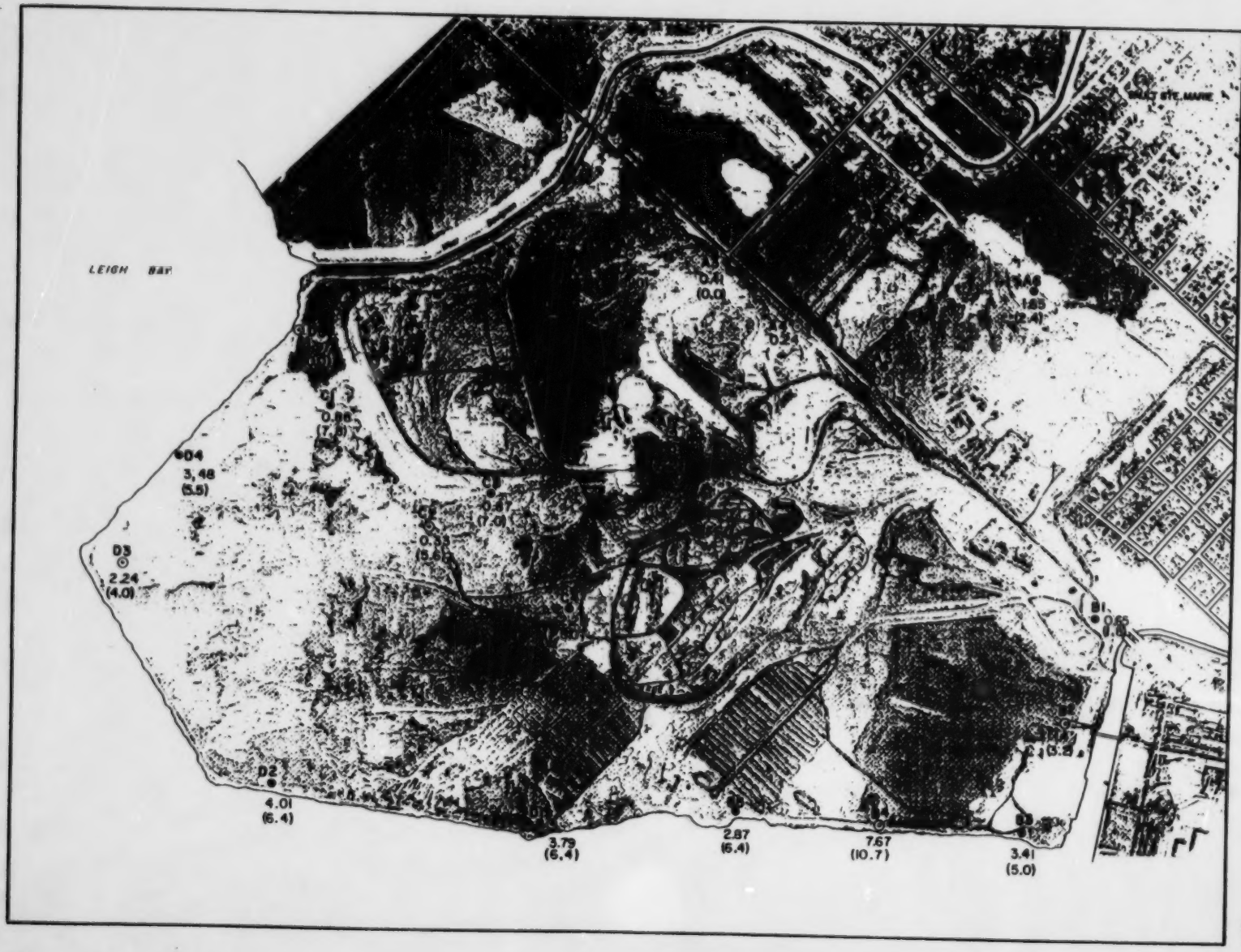


FIGURE A8.2

Shallow Groundwater Level to Original Ground Surface

- ⊙ nested monitors
- ● individual monitors
- 1.6 depth of water table
  + above ground surface
  - below ground surface
  (metres)
- (0.8) thickness of slag/fill

water level as of 88/10/04

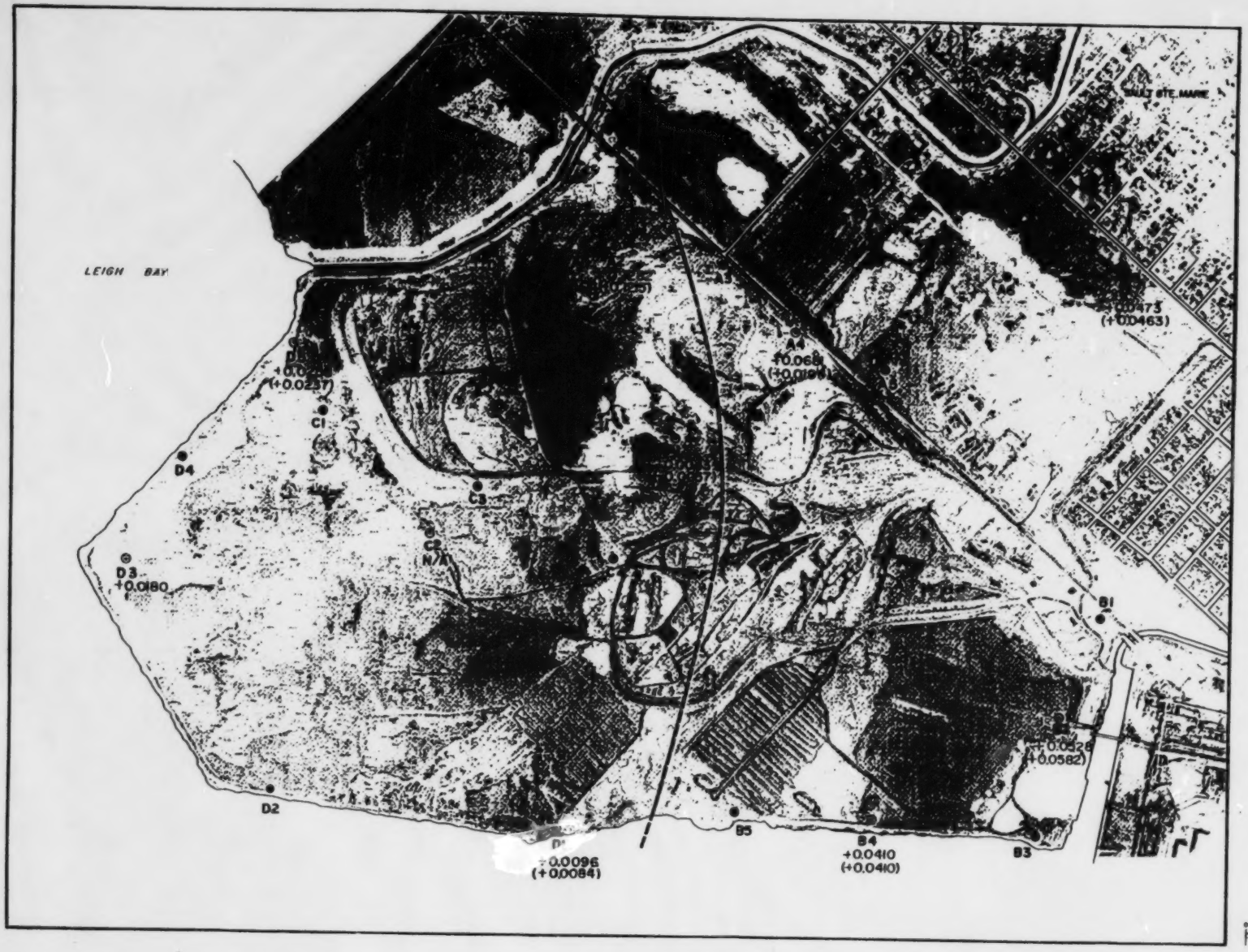


FIGURE A 8.3

Vertical Hydraulic Gradients

+ve - upward
-ve - downward
⊙ nested monitors
● individual monitors

0.0 calculated from Oct.4/88 water level data

(0.0) calculated from Oct.18/88 water level data

——— Southwestern limit of clay/silt unit

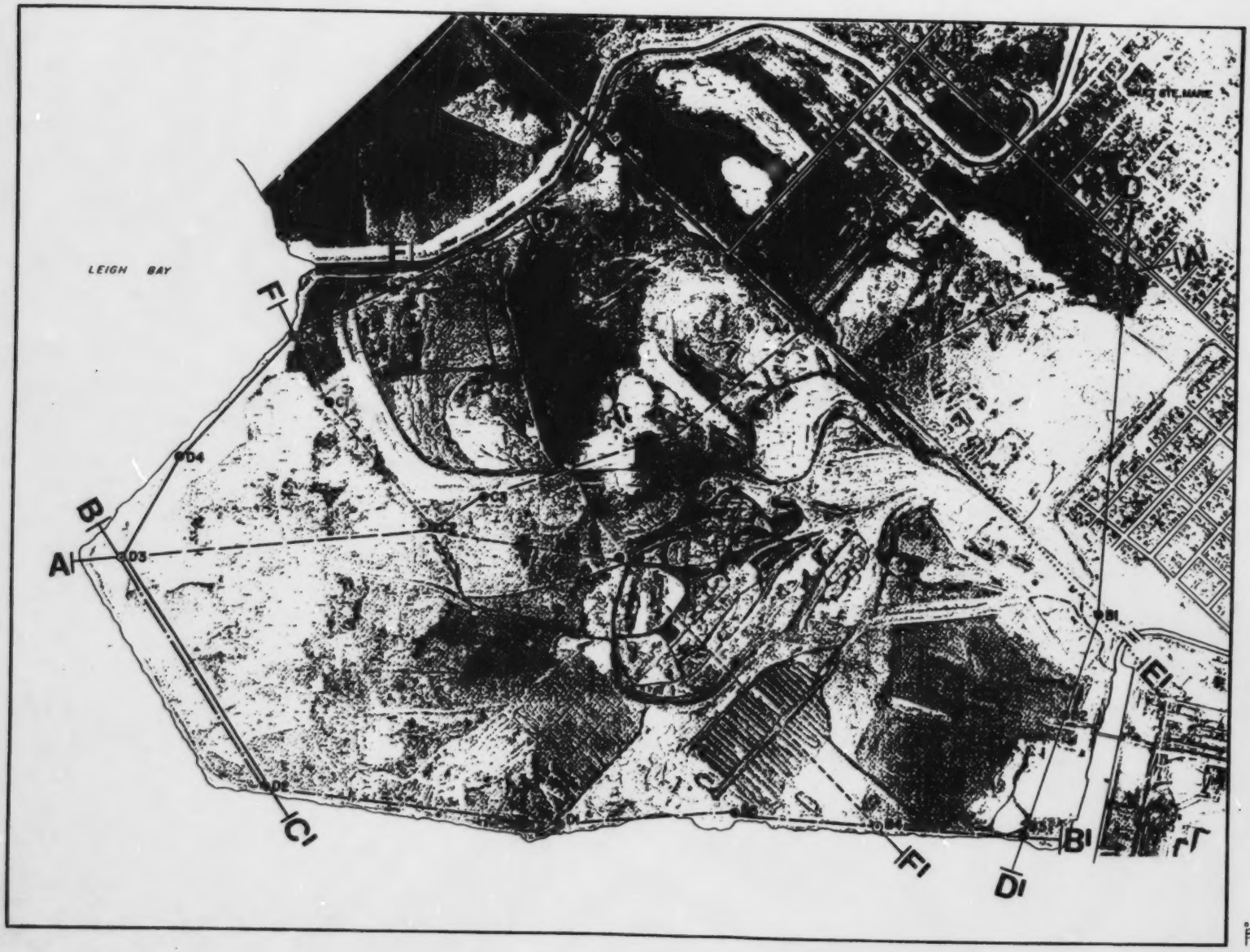


FIGURE A 8.4

Cross Section Locations

- nested monitors
- individual monitors

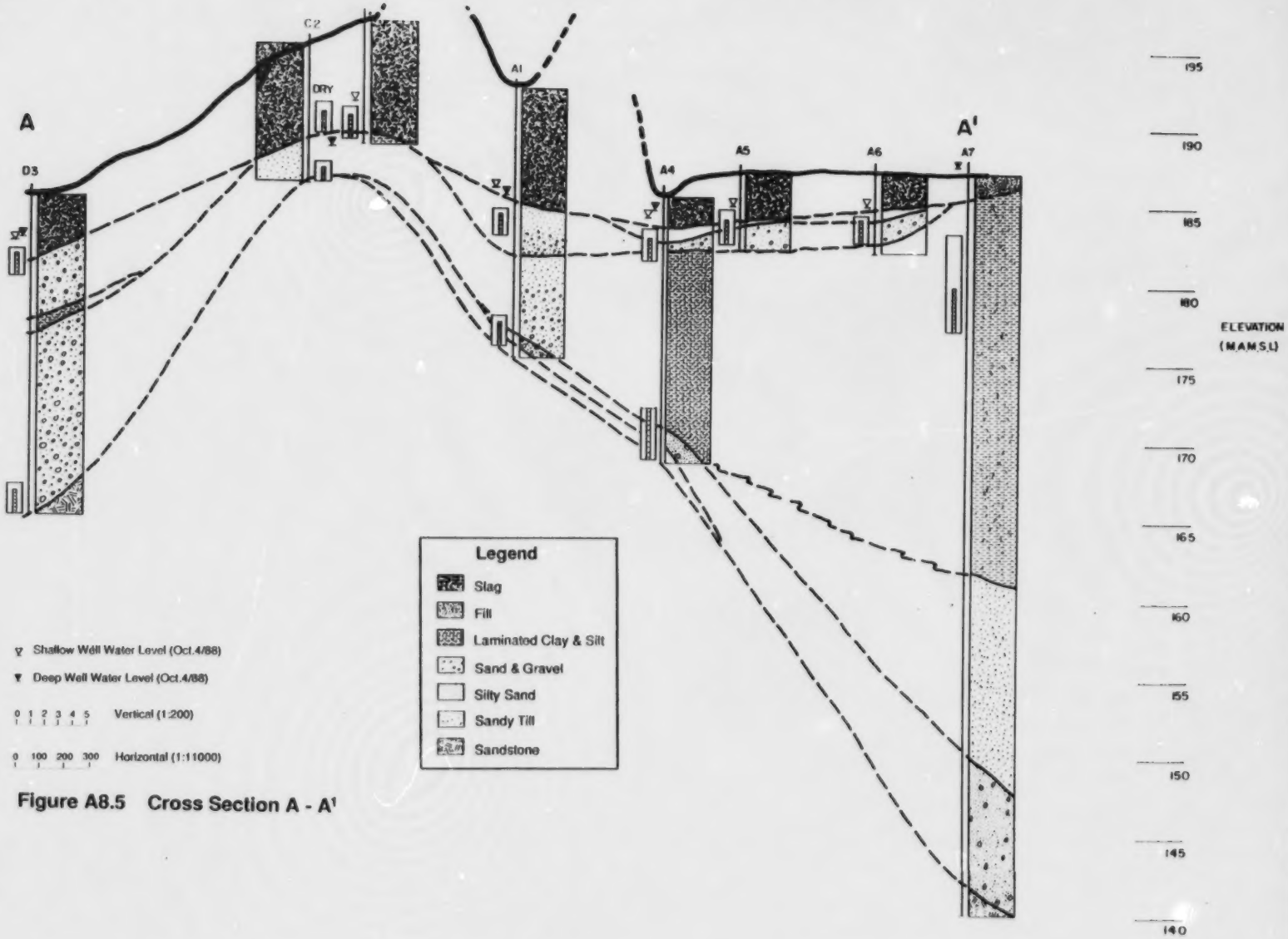


Figure A8.5 Cross Section A - A'

Figure A8.6 Cross Section B - B¹

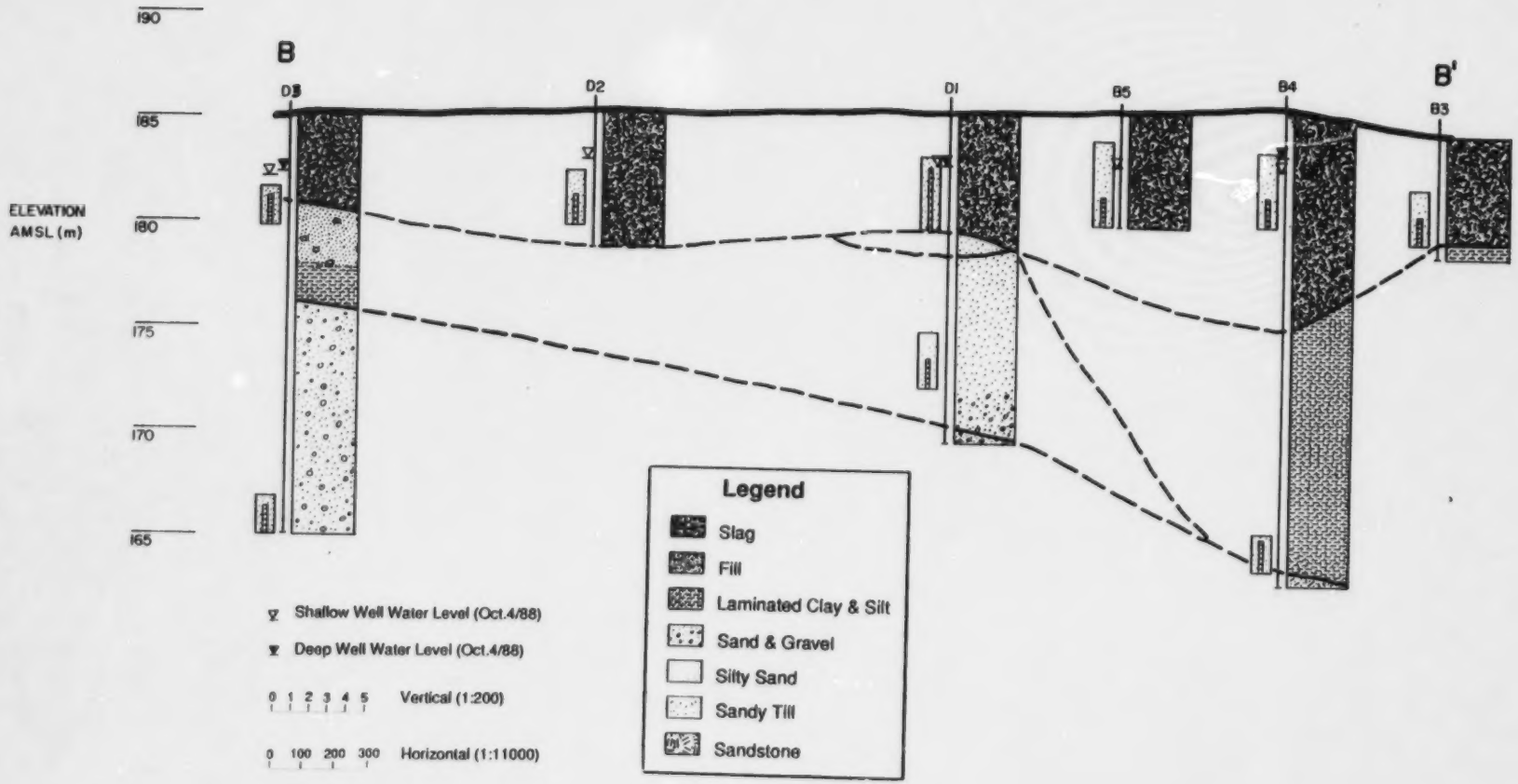


Figure A8.7 Cross Section C - C¹

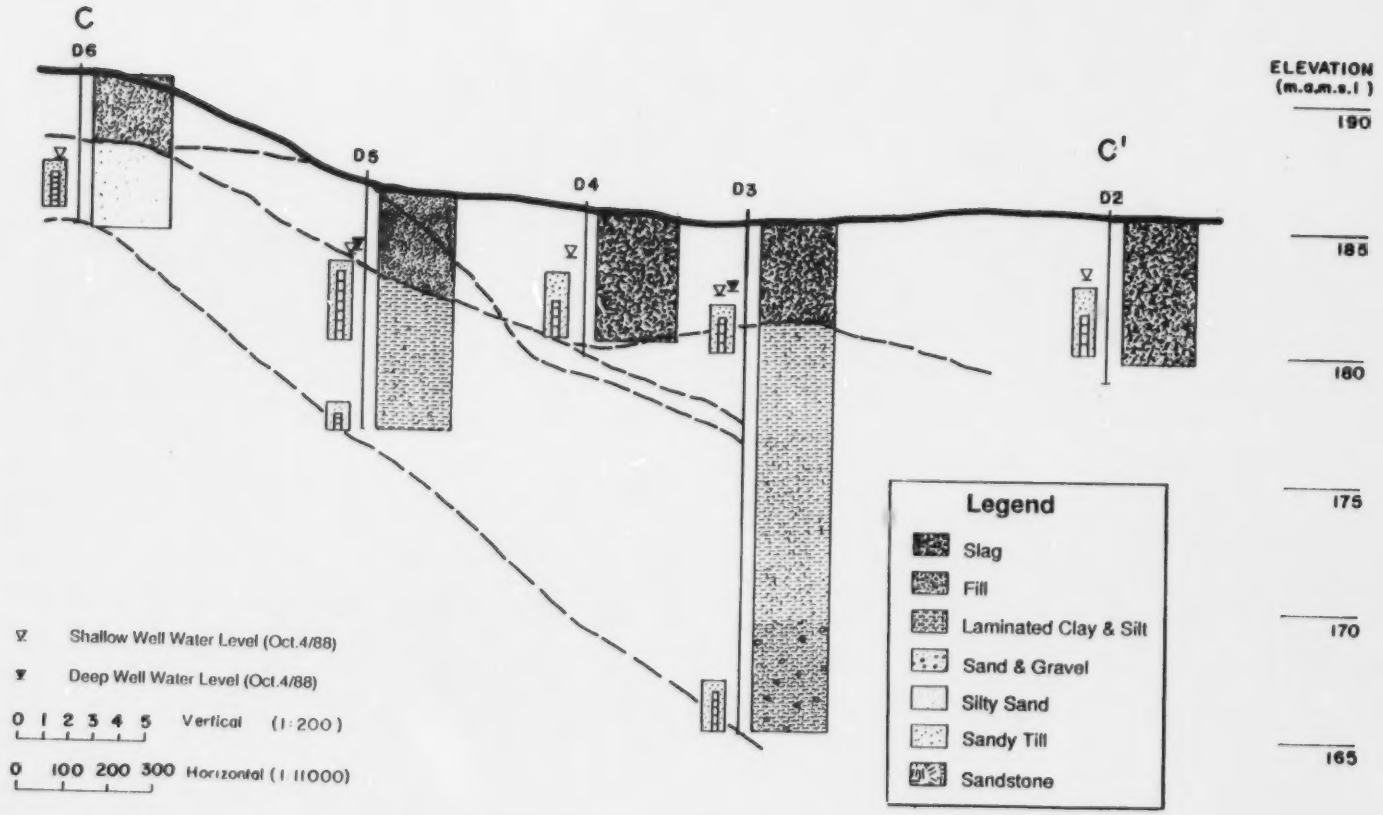


Figure A8.8 Cross Section D - D¹

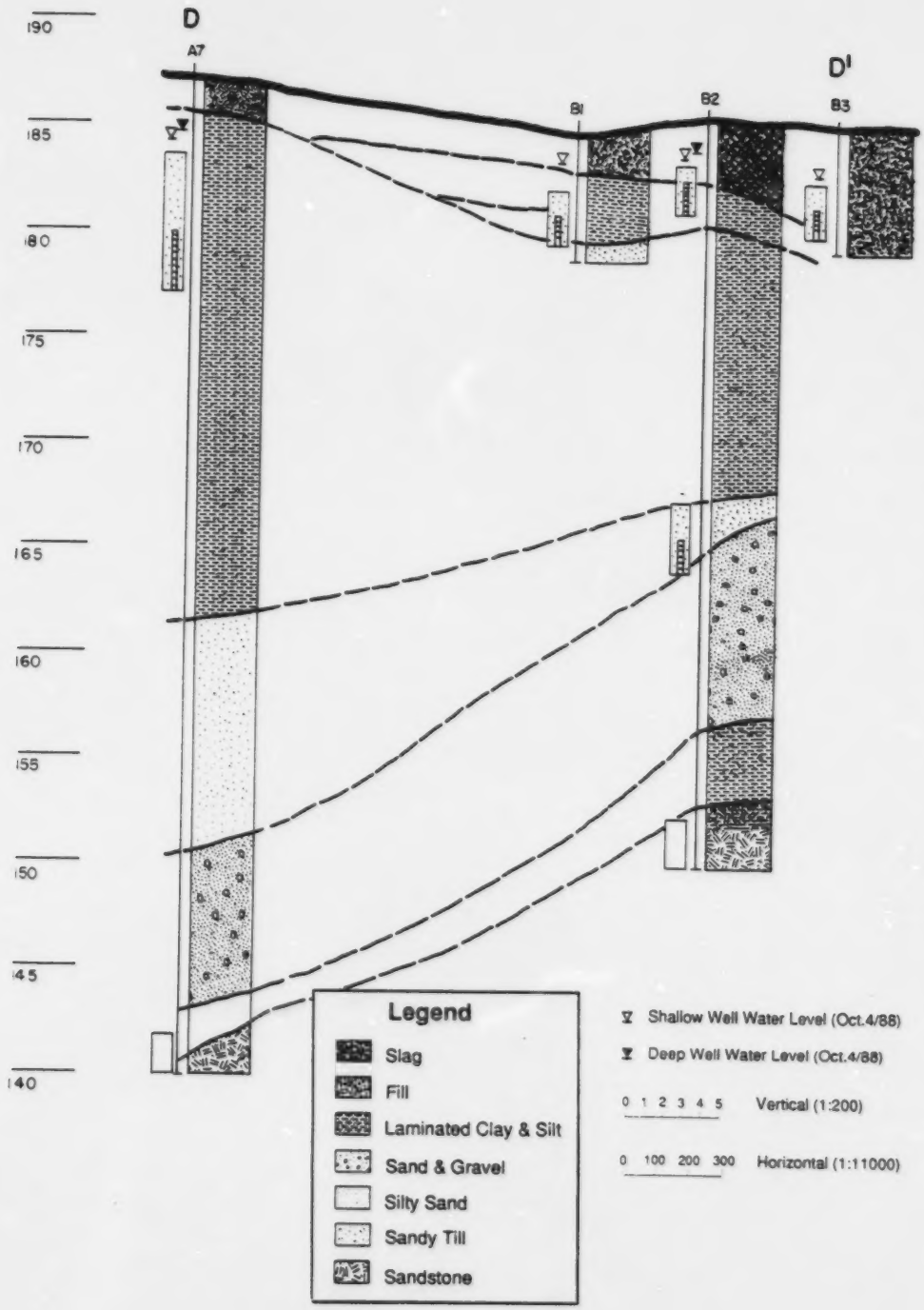


Figure A8.9 Cross Section E - E¹

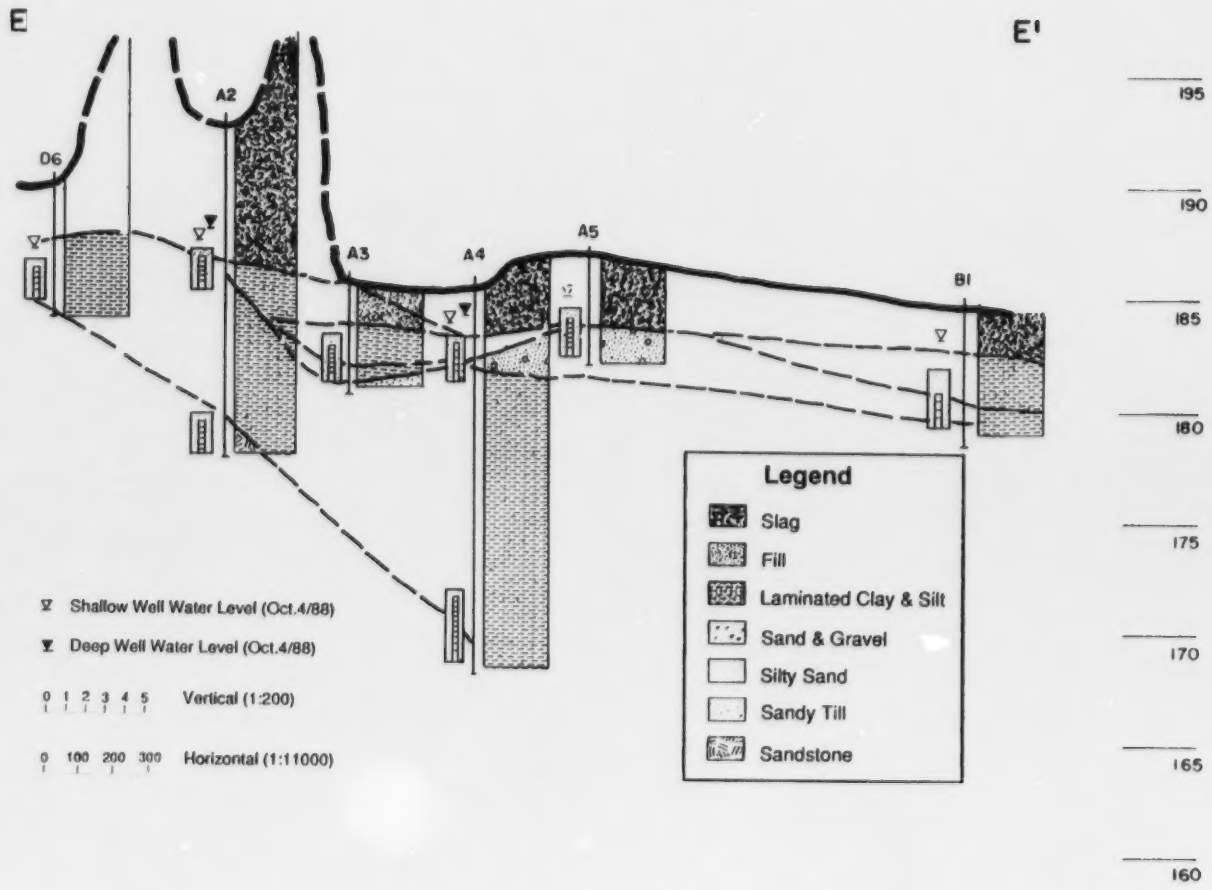
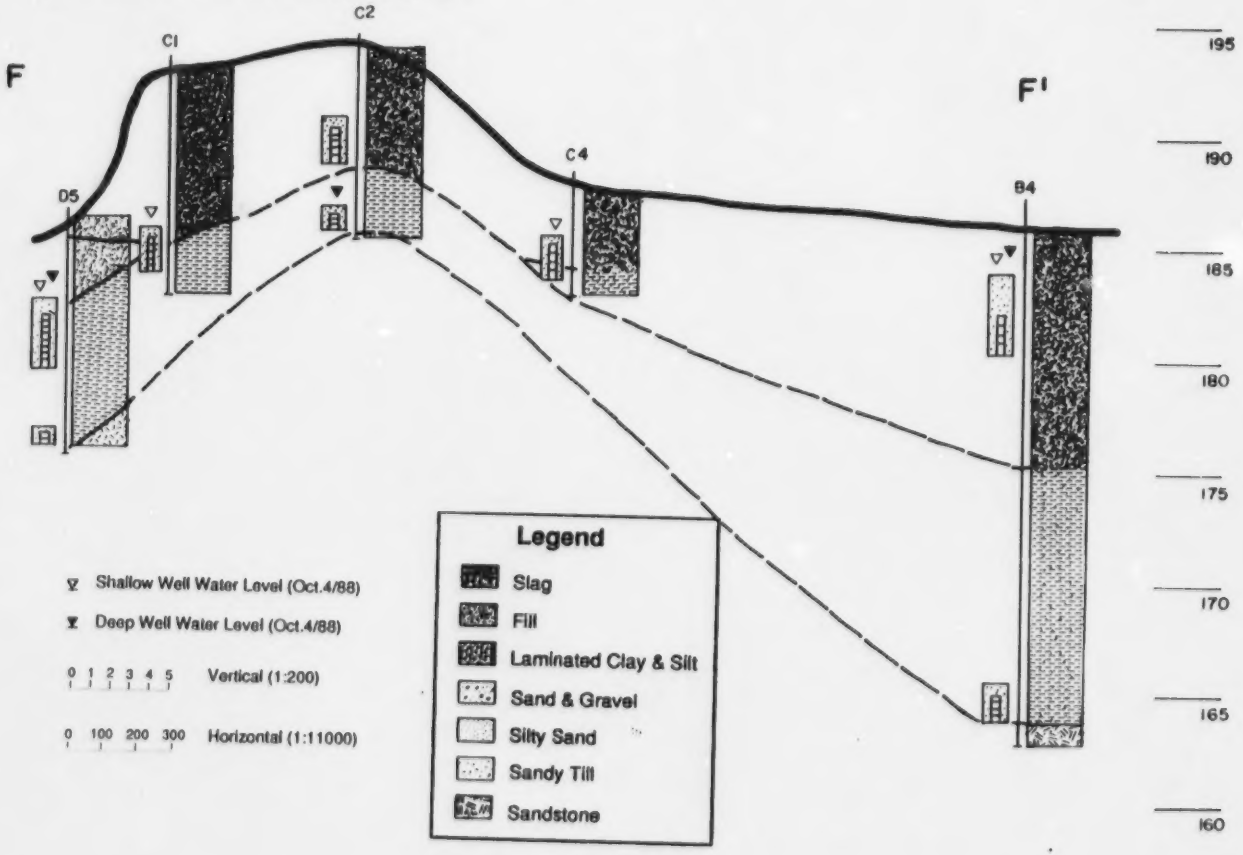


Figure A8.10 Cross Section F - F¹



SEEPAGE STUDY

BY

D.R. LEE

CHALK RIVER NUCLEAR LABORATORIES

SEPTEMBER 1988

REPORT ON SEEPAGE INVESTIGATION

13 JULY TO 20 JULY 1988
ON ALGOMA STEEL CORP. SHORELINE
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1988 September 15

SUMMARY

This is part of a current study to assess the offsite migration of groundwater solutes from the Algoma Steel Corp. This work was done in support of Beak in their larger contract for the Ministry of the Environment.

Seven additional targets for possible future hydrogeological work were identified on the basis of elevated electrical conductance (EC) on the bed of the St. Marys River.

Three piston cores of sediment were recovered, photographed, visually logged and packaged for possible later analyses by Beak. Sediment conditions at several EC anomalies were not conducive to further investigation from the river; cobbles, stones, or chunks of slag interfered.

Four piezometers were installed near the barge in Leigh Bay and 1 piezometer within a kilometre of the Algoma slip near the east end of the site. These piezometers produced water of elevated electrical conductance, and they were sampled by us for analyses by Beak. Field EC values ranged from 340 to 2650 μS/cm in these groundwaters as compared with the river at 80 μS/cm. Seven piezometers, emplaced a year before (Lee and Welch, contract report), were recovered and anchored on shore for Beak to sample as required.

Seepage meters were used to demonstrate and quantify the upwelling of groundwater at 2 sites, Site A and Site 1. Site 1 was studied in 1987 but seepage had never been conclusively proven. Upward rates of groundwater discharge were 13 m/yr at Site 1 and 3 m/yr at Site A. If one assumes a porosity of 0.33, these measurements can be multiplied by 3 for ballpark estimates of interstitial flow.

SEDIMENT RECONNAISSANCE

A sediment electrical conductance survey (Lee, 1985) was conducted along lines parallel to shore at distances offshore of 10, 20, 30, 50, 75 and 100 m. Before doing the survey, shoreline reference numbers were painted on shore at 200 m intervals to aid in relating strip chart records to known positions (Figure 1). To keep survey lines on course, flagged buoys were placed on lines perpendicular to shore at 400 m intervals. Significantly elevated electrical conductance (EC) was observed at the following locations:

Site C - 20 m offshore at reference 1 (see Figure 1 for location shoreline reference points)

20 m offshore at reference 4.3 and 4.5

20 m offshore at reference 7.5

30 to 100 m offshore at reference 13

Site A - 10 m offshore north of the barge and within 20 m of it at reference 3. Four piezometers (A1,A2,A3,A6) were installed. A sketch of Site A is in the Section on Core Results. Using SCUBA we found that the sediment surface in this area was lightly encrusted (probably $CaCO_3$) and was stony but cores (A4,A5) were taken between gravelly areas.

Shore Reference 17.3 - ≈ 10 m offshore at the toe of the slag at reference 17.3.

Site B - ≈ 10 m offshore at the toe of the slag at reference 16.2. A 2.8 m core was taken and a piezometer (B1) was installed.

Other sediment areas displayed elevated electrical conductance too, but time did not permit us to mark them and attempt further study.

PIEZOMETER RESULTS

Four piezometers (A1,A2,A3,A6) were installed using the method of Welch and Lee (in press) at Site A, 10 m offshore and immediately north of the two barges at reference 3 (Figure 1). Heads were not obviously above river level, but porewater electrical conductance ranged from 865 to 2650 μS/cm. This was evidence of the upward motion of slag leachate at that site.

At shore reference 17.3 (Figure 1) about 10 m offshore at the toe of the slag, the sediments "felt" silty to 1.2 m below the sediment water interface. However chunks of slag or other stones prevented piezometer installation and coring. See Photo 3.

At Site B (about 10 m offshore at reference 16.2, Figure 1) a single piezometer (B1) was installed. Electrical conductance of a sample pumped from this piezometer was 340 μS/cm. Although the static head was not clearly positive relative to river, earlier experience with such piezometers along this shore has been that the gradient is too low and the piezometer screen is too shallow to show an obvious meniscus above the river. Attachment of submerged, flexible plastic bags to other such piezometer lines and measurement of flow into the bag provided evidence of upward potentials elsewhere along this shore in 1987.

At the above Site C and 20 m offshore at references 4.3 and 4.5, piezometers were installed but porewater could not be withdrawn due to low permeability material (probably silt). At these sites there may be: a) a thin lens of sand conducting leachate offshore (but this is missed with the piezometers unless detailed coring is done), or b) seepage from the toe of slag and this diffuses into the surrounding sediments.

Within the large EC anomaly 30 to 100 m offshore at reference 13, several hours were spent probing with an E-rod. Results confirmed the existence of soft sediment (10 to 20 cm thick) over cobble. Because methods do not exist for offshore manual installation of piezometers or cores in cobble, the effort to instrument and sample this site was abandoned.

A nearby area, Site 1 (reference 13.25), was not included in the sediment survey because we did not wish to disturb seven existing piezometers and lines to shore. This area was intensively investigated in 1987 (Figure 2). An MOE diver had anchored the piezometer lines (copper and polyethylene) at the shore in November 1987. We recovered these piezometer tubes, anchored them at the shoreline, made several measurements of head and collected water samples. Results summarized in Table 1 show that this site is an example of strong groundwater upwelling. Stratigraphic information should be obtained on the adjacent land and the groundwaters both on land and beneath the river should be included in the chemical data base for the Algoma study program.

Table 1. Summary of Information from Offshore Piezometers

Piezometer Number	Location	Depth of Screen Below Riverbed, m	Head Relative to River Surface, cm	Field Electrical Conductance, µS
A1	Site A, next to barge, reference point 3, Figure 3	≈1	-0.5	2080
A2		0.75		1200
A3		0.80		865
A6		≈1		2650
B1	Site B ≈40 m east of reference 16 at toe of slag	2.8	±1, not obviously different	340
C1	Site C ≈20 m offshore at rebar at reference 1	≈1	no response, this piezometer is of little value	-
P30	See Figure 2, Site 1, ≈50 m east of shore reference 13	1.3	+6.0 (+27.5*)	1540
P46		2.3	-	-
P47		2.3	+4	1424
P48		2.3	+8.5	475
P49		2.3	+9.5 (+3.4*)	466
P50		2.3	+47	1640
P51		2.3	+7.7	1730
P52		2.0	9.0	1290

*head measurements 27.5 and 34 cm above river were made during a wind-related event Saturday, July 16

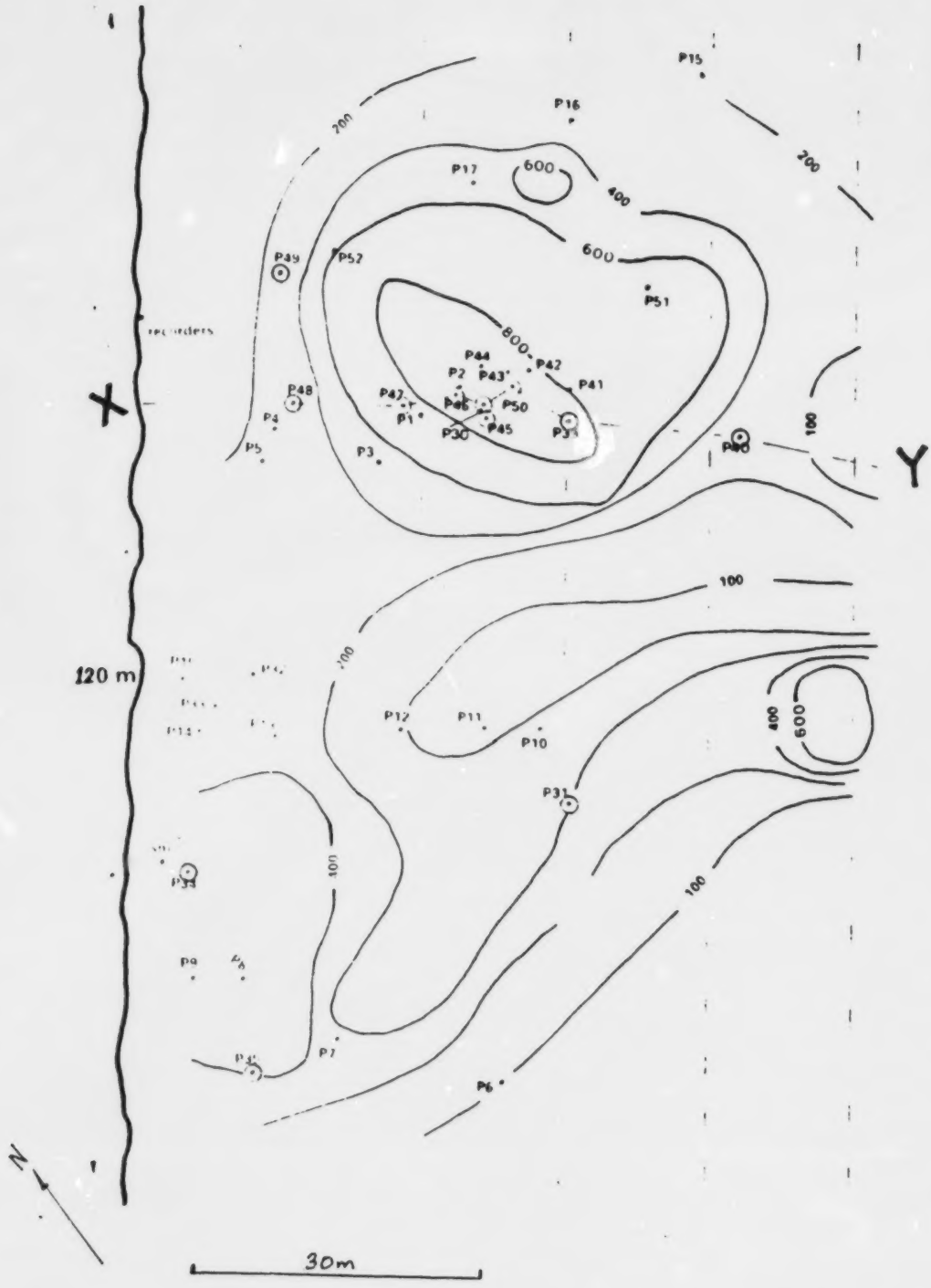


FIGURE 2. Site 1 instrument, core locations and sediment electrical conductance contours. (From contract report by Lee and Welch.)

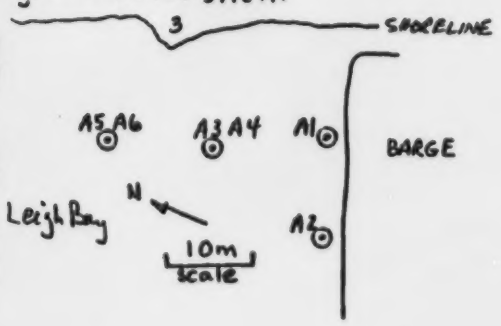
SEDIMENT CORES

These are the results of cores of the St. Marys Riverbed near Algoma Steel Corp. Refer to Figure 1 for locations and sites.

LOCATION A4

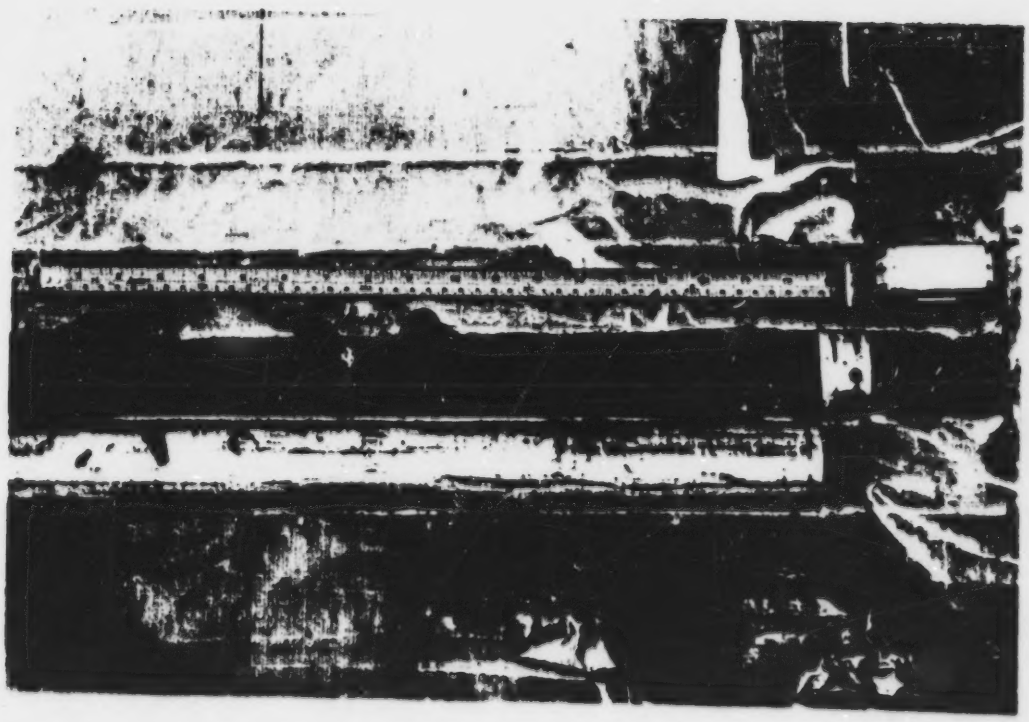
SITE A
DATE 880718
WATER DEPTH 2.25 m
CORE LENGTH 0.3 m

Fig. 3 Sketch of site A.

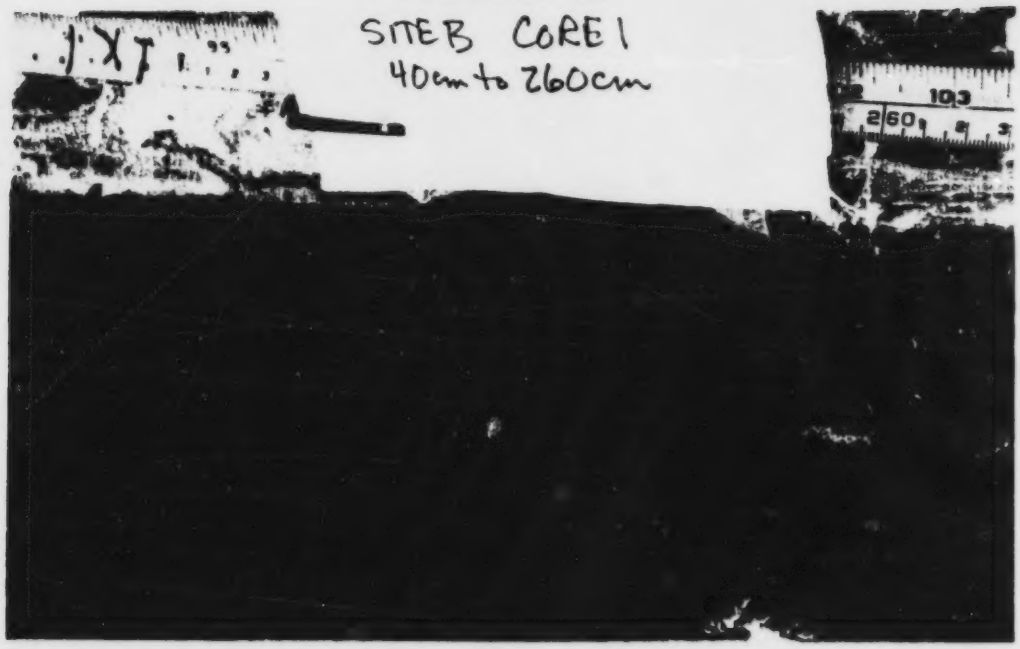


Depth, cm	Notes
0-30	red-brown, poorly-sorted silty sand with slag chunks up to 2.5 cm diameter

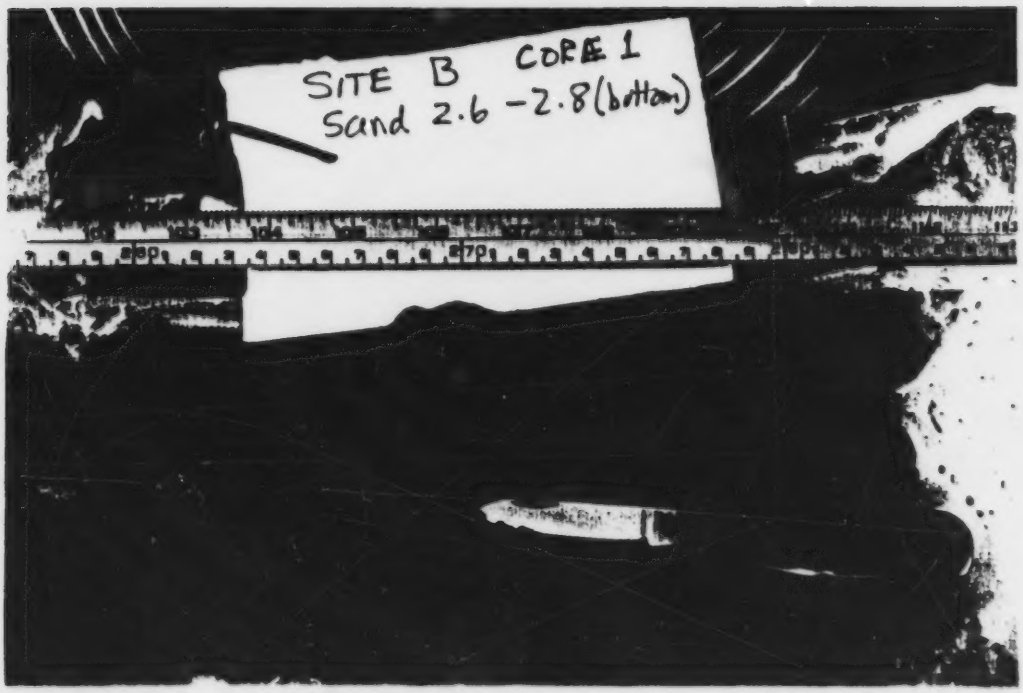
COLOUR PHOTO 24



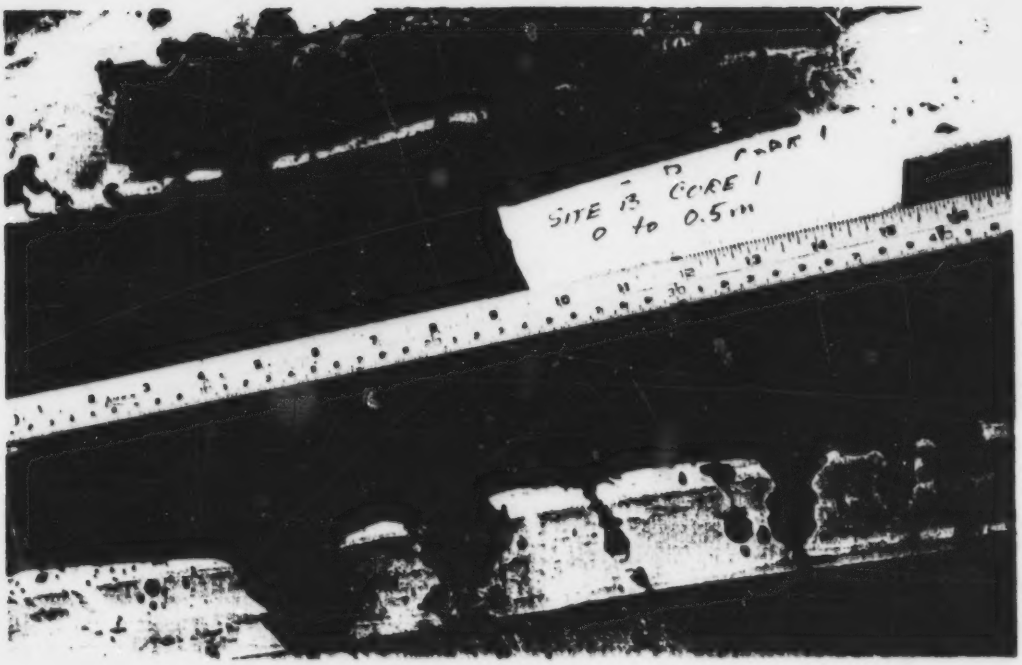
COLOUR PHOTO 12



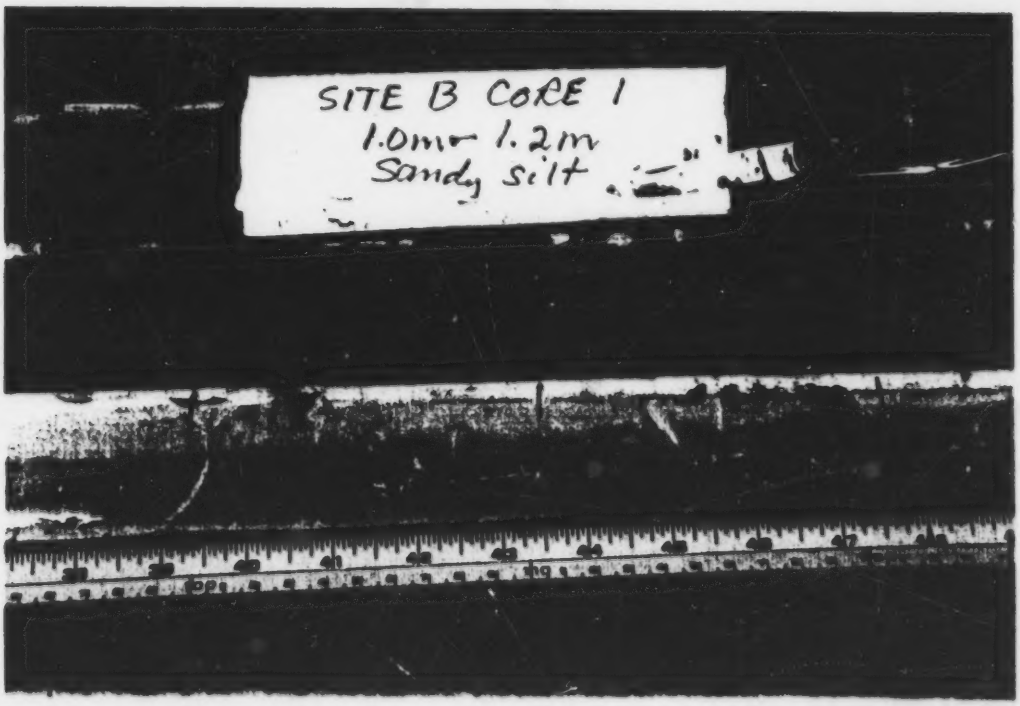
COLOUR PHOTO 9



COLOUR PHOTO 13



COLOUR PHOTO 15



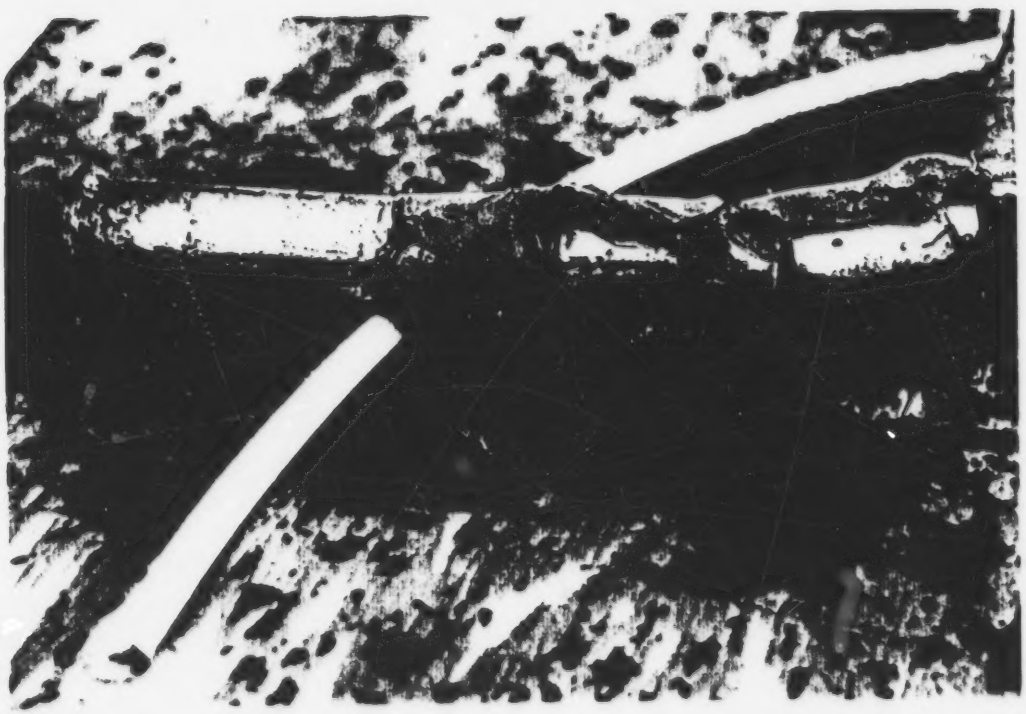
LOCATION (17.3 m on shoreline)

SITE F
DATE 880718
WATER DEPTH ≈ 3 m
CORE LENGTH none

An electrical conductance anomaly was found along the toe of the slag in ≈ 3 m of water. Coring was not attempted because we could not install piezometers due to rocks within a soft sediment.

Photo 3 shows one piezometer tip after an aborted installation.

COLOUR PHOTO 3



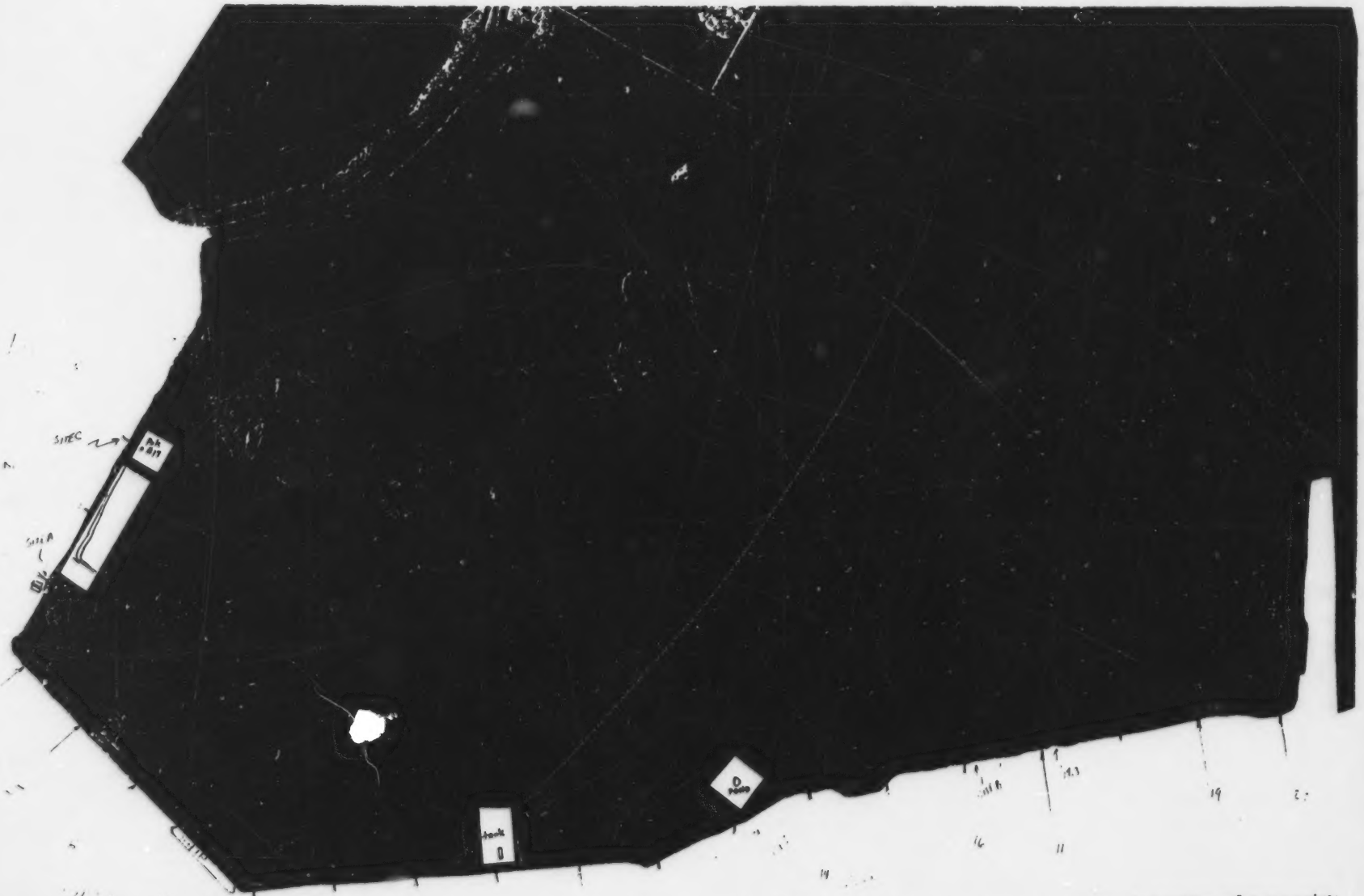


FIGURE 1. Map of slag site showing positions of shoreline reference points which were painted on shore to aid sediment and seepage work.

LOCATION A5

SITE A
DATE 880718
WATER DEPTH ≈ 2 m
CORE LENGTH ≈ 0.8 m

Depth, cm	Notes
0-60	poorly-sorted coarse to fine sand with rounded pebbles to 1 cm diameter and slag chunks
60-80	poorly-sorted red-brown medium to fine sand with silt and chunks of red-brown medium to fine grained sandstone

LOCATION B1

(≈ 16.2 m along shoreline)

SITE B
DATE 880719
WATER DEPTH 2.5 m
CORE LENGTH 2.8 m

Depth, cm	Notes
0-50	black ooze (photo 13 below)
50-260	dark brown, fine sandy silt (photos 15 and 12 below)
260-280	poorly-sorted medium to fine brown sand (photo 9 below)

SEEPAGE MEASUREMENTS

Seepage meters (Lee, 1977) were constructed from plastic drums. The meters were 0.152 m^2 in area and 60 cm in length. The length was needed for installation into the firm sand that lies beneath the soft surficial sediment in some areas. Specific discharge rate averaged 0.4 μm/s or 13 m/yr at Site 1 and 0.1 μm/s or 3 m/yr at Site A (Table 2)

REFERENCES

1. METHOD FOR LOCATING SEDIMENT ANOMALIES ON LAKEBEDS THAT CAN BE CAUSED BY GROUNDWATER FLOW
   D.R. Lee
   J. Hydrol. 79, 187-193 (1985)

2. RESEARCH AND DEVELOPMENT OF METHODS FOR LOCATING AND ESTIMATING CONTAMINANT LOADING VIA GROUNDWATER ENTERING THE ST. MARYS RIVER
   D.R. Lee and S.J. Welch
   Contract report. Penultimate draft submitted to MOE (1988)

3. A METHOD FOR INSTALLING AND MONITORING PIEZOMETERS IN BEDS OF SURFACE WATERS
   S.J. Welch and D.R. Lee
   Ground Water (in press)

Table 2. Seepage Meter Results at Sites 1 and A

Seepage Meter	Location	Time of Measurement, hr.	Volume of Water Displaced through the meter, L	Calculated Specific Discharge, μm/s
A	a cluster of four meters placed 2 m apart at Site 1 near P30, Figure 2	0.37	0.10	0.50
		0.23	0.34	0.27
B		0.37	0.125	0.62
		0.23	0.25	0.20
C		0.37	0.035	0.17
		0.23	0.25	0.20
D		0.37	0.12	0.60
		0.23	0.69	0.54
SM 34	near shore, Figure 2	2.67	1.05	0.42
		0.50	0.11	0.24
F	near A-2, Site A	2.33	0.06	0.046
G	near A-1, Site A	2.5	0.09	0.065
I	also near A-1, Site A	2.5	0.02	0.14
J	between A1 and A3, see Figure 3	2.1	0.22	0.188

APPENDIX 8

Geologic Data Base

Appendix 8: Geology Data Base -West Site

Borehole ID.	Current Gd. Elevn	Top of Casing	Elevation of Screened Interval		Elevations of Bottom and Thicknesses of Geologic Units						
			top of sand	bottom of sand	slag/fill	slag thickness	silty sand	sand thickness	sand till	till thickness	bedrock
BEAK 1988											
A1-1	192	193	178	176	185	7	182	3	175	7	eoh
A1-2	192	193	185	183	185	7	eoh@183.00				
A2-1	193	194	180	178	187	6	182	5	eoh@177.80	>3.80	
A2-2	193	193	187	185	187	6	eoh@185.30				
C1	193	194	186	184	185	8	eoh@183.95	>1.30			
C2-1	195	195	187	186	189	6	188	1	186	3	eoh
C2-2	195	195	191	189	eoh @189.15						
C3	196	197	191	189	189	7	eoh@188.70	>0.70			
C4	188	189	186	184	eoh @183.10	>5.00					
D1-1	186	187	175	172	180	6	171	9	eoh@169.60	>1.15	
D1-2	186	187	184	180	eoh @179.95						
D2	186	187	183	180	eoh @179.20	>6.40					
D3-1	185	186	166	164	181	4	176	5	165	11	eoh
D3-2	185	186	181	180	181	4	eoh@179.65				
D4	185	186	183	180	180	5	eoh@179.46	>0.43			
D5-1	186	187	177	176	186	0	183	3	eoh@176.30	>6.50	
D5-2	186	187	183	181	186	0	183	3	eoh@180.50		
D6	190	191	187	185	188	3	ne		184	3	
GEOCON 1983											
1-A	185	187	178	172	ne		184	1	178	6	eoh@171.50
1-B	185	187	185	180	ne		184	1	eoh@180.20		
2-A	184	186	175	172	ne		183	1	178	5	eoh@171.50
2-B	184	186	184	179	ne		183	1	eoh@178.90		

Appendix 8: Geology Data Base -West Site

Borehole ID.	Current Gd. Elevn	Top of Casing	Elevation of Screened Interval		Elevations of Bottom and Thicknesses of Geologic Units						
			top of sand	bottom of sand	slag/fill	slag thickness	silty sand	sand thickness	sand till	till thickness	bedrock
3	186	187	185	180	184	3	ne		eoh@176.70	>6.80	
4-A	189	190	179	178	186	4	184	2	182	2	eoh@176.10
4-B	189	190	189	184	186	4	eoh@184.30				
6	189	190	189	184	ne		188	1	184	4	eoh
7	189	190	188	181	ne		185	4	181	4	eoh
9-A	190	191	177	175	188	2	ne		178	10	eoh@175.10
9-B	190	191	190	186	188	2	ne		eoh@186.30		
10	193	194	192	184	187	6	186	2	eoh@183.10	>2.60	
11	204	205	203	187	189	15	ne		eoh@186.90	>2.38	

Thicknesses in metres, elevations in metres above mean sea level
ne = unit not encountered
eoh = end of borehole at contact between units
eoh@# = end of borehole within unit

Appendix 8: Geology Data Base - East Site

Borehole ID	Current Gd. Elevn	Top of Casing	Elevation of Screened Interval		Elevations of Bottoms and Thicknesses ofGeologic Units										
			top of sand	bottom of sand	slag/fill	slag thickness	organic silt	silt thickness	shallow sand	sh. sand thickness	laminated clay/silt	clay/silt thickness	basal sand	basal thickness	bedrock
OW4B-88	185	186	183	183	183	2	ne		eoh@182.37						
OW5-88	185	185	182	181	183	2	ne		181	2	eoh@178.73				
OW6-88	185	186	183	182	183	2	ne		182	1	eoh@179.80				
OW7A-88	185	185	183	182	183	2	183	0	182	1	eoh@179.58				
OW7B-88	185	186	185	183	eoh@183.27										
OW8A-88	185	185	181	180	183	1	183	0	180	3	eoh@179.58				
OW8B-88	185	186	184	183	183	2	183	0	eoh@182.64						
OW9A-88	185	185	181	180	183	2	183	0	180	3	eoh@178.03				
OW9B-88	185	185	184	183	183	2	183	0	eoh@182.69						
OW10A-88	185	185	181	180	183	2	182	0	180	2	eoh@178.56				
OW10B-88	184	185	184	183	183	2	eoh@182.62								
OW11A-88	185	186	182	181	184	2	183	0	180	3	eoh@179.84				
OW11B-88	185	186	184	183	184	2	eoh@183.18								
OW12A-88	185	185	183	180	183	2	183	0	179	3	eoh@177.13				
OW12B-88	185	185	184	183	eoh@183.08										
OW13A-88	185	186	181	180	183	2	183	0	182	1	eoh@178.34				
OW13B-88	185	186	182	182	183	2	183	0	182	1	eoh@181.72				

GARTNER LEE
1987

Appendix 8: Geology Data Base - East Site

Borehole ID	Current Gd. Elevn	Top of Casing	Elevation of Screened Interval		Elevations of Bottoms and Thicknesses ofGeologic Units										
			top of sand	bottom of sand	slag/fill	slag thickness	organic silt	silt thickness	shallow sand	sh. sand thickness	laminated clay/silt	clay/silt thickness	basal sand	basal thickness	bedrock
BEAK 1988															
A3	186	186	183	181	184	2	181	3	ne		eoh@180.65	>3.20			
A4-1	185	186	172	169	183	2	ne		181	3	171	10	169	2	eoh
A4-2	185	186	183	181	183	2	ne		eoh@181.15	-					
A5	187	188	185	182	184	3	ne		eoh@182.30	>1.7					
A6	187	188	184	183	185	2	ne		eoh@182.50	>2.2					
A7-1	187	188	142	139	185	2	ne		178	7	161	17	142	19	eoh@139.00
A7-2	187	188	183	177	185	2	ne		178	7	eoh@176.50	>3.50			
B1	184	185	182	179	183	2	179	3	eoh@179.05	>3.60					
B2-1	186	186	167	164	182	3	ne		180	2	165	15	eoh@162.40	>2.50	
B2-2	186	186	183	181	182	3	ne		eoh@180.90	-					
B2-3	186	-	153	150	182	3	ne		180	2	165	15	154	11	eoh@150.10
B3	185	186	182	180	180	5	eoh@179.45	>0.30							
B4-1	186	187	165	163	175	11	ne		ne		163	12	eoh		
B4-2	186	187	184	180	eoh@180.15	-									
B5	186	187	184	180	eoh@180.05	>5.70									
GEOCON															
5-82	188	189	188	181	183	6	ne		181	2	eoh@178.80	>2.46			
8-82	186	187	182	180	185	1	183	2	ne		eoh@178.90	>4.30			
1B-80	185	-	-	-	177	8	ne		ne		172	5	164	7	eoh
2B-80	185	-	-	-	177	8	ne		ne		173	4	164	9	eoh
3B-80	185	-	-	-	178	7	175	3	eoh@166.60	>8.20					
4B-80	185	-	-	-	176	9	ne		ne		172	4	164	7	eoh
5B-80	186	-	-	-	174	11	ne		ne		173	1	159	14	eoh
6B(river)	183.37	river bottom at 176.9			ne		176	~0.60	ne		170	6	eoh@161.20	>9.00	

Appendix 8: Geology Data Base - East Site

Borehole ID	Current Gd. Elevn	Top of Casing	Elevation of Screened Interval		Elevations of Bottoms and Thicknesses ofGeologic Units										
			top of sand	bottom of sand	slag/fill	slag thickness	organic silt	silt thickness	shallow sand	sh. sand thickness	laminated clay/silt	clay/silt thickness	basal sand	basal thickness	bedrock
1-I	186	187	179	177	184	2	ne		181	2	eoh@176.05				
1-II	186	187	183	181	183	2	ne		eoh@181.28						
1-III	185	186	185	183	eoh@183.36										
2-I	185	186	182	181	183	2	183	0	181	2	eoh@180.31				
2-II	185	186	184	183	eoh@182.43										
3-I	185	185	182	181	182	2	182	0	181	2	eoh@180.23				
3-II	185	185	184	183	eoh@182.87										
4-I	185	185	183	180	183	2	183	0	180	3	eoh@179.93				
4-II	185	186	185	183	eoh@182.96										
5-I	185	186	181	180	182	2	182	1	180	2	eoh@179.12				
5-II	185	185	184	183	eoh@182.51										
6-I	185	186	178	176	183	2	182	1	179	2	eoh@175.37				
6-II	185	186	182	179	183	2	182	1	179	2	eoh				
6-III	destroyed														
7-I	185	186	181	179	183	2	181	2	179	2	eoh@178.74				
7-II	185	186	185	183	eoh@182.99										
8-I	185	186	182	180	183	2	183	1	180	3	eoh@179.6				
8-II	185	186	185	183	eoh@183.19										
9-I	185	186	179	176	183	2	182	1	181	1	eoh@175.55				
9-II	185	186	182	181	183	2	182	1	181	1	eoh				
9-III	185	186	185	183	183	2	eoh								
10-I	185	186	182	180	183	2	183	0	181	3	eoh@179.93				
10-II	185	186	185	183	eoh@183.32										
11-I	185	186	178	176	184	1	183	0	181	3	eoh@175.39				
11-II	185	186	182	180	184	1	183	0	180	3	eoh				
11-III	185	186	185	183	184	1	183	0	183	1	eoh				

Appendix 8: Geology Data Base - East Site

Borehole ID	Current Gd. Elevn	Top of Casing	Elevation of Screened Interval		Elevations of Bottoms and Thicknesses ofGeologic Units										
			top of sand	bottom of sand	slag/fill	slag thickness	organic silt	silt thickness	shallow sand	sh. sand thickness	laminated clay/silt	clay/silt thickness	basal sand	basal thickness	bedrock
DOMTAR 1952															
DOM-1	185	-	-	-	180	5	ne		178	2	158	20	149	9	eoh@123.91
COOPER CRANE 1974															
CC-1	186	-	157	155	-		-		177	9	158	18	eoh@153.60		

ne = unit not encountered

eoh = end of borehole at contact between units

eoh@# = end of borehole within unit

eop = end of penetration test, at contact

eop@# = end of penetration test within unit

APPENDIX 9

Groundwater Flux Calculations

VOLUMETRIC FLUX CALCULATIONS

Appendix 9: Groundwater Volumetric Flux Calculations - Algoma 1988, 1989

Q=KIA **where A=bL**

Average Flux

Element No.	Discharge to	Discharge through	Average Hydraulic Cond., K (m/s)	Average Hydraulic Grad., i (-)	Area, A: Thickness b (m)	Area, A: Length L (m)	Flux, Q (m3/s)	Flux, Q (m3/yr)
A	St. Marys River	slag	5.2E-05	0.0089	2.45	2765	3.1E-03	9.9E+04
B	West Davignon Diversion	till	6.8E-07	0.0083	1.12	1300	8.2E-06	2.6E+02
C	Baseline Road ditch	slag	5.2E-05	0.013	1.7	1000	1.1E-03	3.6E+04
C	Baseline Road ditch	sand	8.7E-05	0.013	2.7	1000	3.1E-03	9.6E+04
C	Baseline Road ditch	TOTAL					4.2E-03	1.3E+05
C	St. Marys River	slag	5.2E-05	0.013	2.66	708	1.3E-03	4.0E+04
C	St. Marys River	sand	8.7E-05	0.013	2	708	1.6E-03	5.1E+04
C	St. Marys River	TOTAL					2.9E-03	9.1E+04
D	Bennett Creek	slag	5.2E-05	0.0041	1.13	917	2.2E-04	7.0E+03
D	Bennett Creek	sand	8.7E-05	0.0041	3	917	9.8E-04	3.1E+04
D	Bennett Creek	TOTAL					1.2E-03	3.8E+04
D	Baseline Road ditch	slag	5.2E-05	0.0041	0.67	1417	2.0E-04	6.4E+03
D	Baseline Road ditch	sand	8.7E-05	0.0041	2	1417	1.0E-03	3.2E+04
D	Baseline Road ditch	TOTAL					1.2E-03	3.8E+04
E	St. Marys River	slag	5.2E-05	0.0041	1.38	958	2.8E-04	8.9E+03
E	St. Marys River	sand	8.7E-05	0.0041	2.1	958	7.2E-04	2.3E+04
E	St. Marys River	TOTAL					1.00E-03	3.2E+04
F	Spring Creek	slag	5.2E-05	0.0041	0.67	800	1.1E-04	3.6E+03
F	Spring Creek	sand	8.7E-05	0.0041	3.6	800	1.0E-03	3.2E+04
F	Spring Creek	TOTAL					1.1E-03	3.6E+04
						Total	1.5E-02	4.7E+05

Appendix 9: Groundwater Volumetric Flux Calculations - Algoma 1988, 1989

Minimum Flux

Element No.	Discharge to	Discharge through	Average Hydraulic Cond., K (m/s)	Average Hydraulic Grad., i (-)	Area, A		Flux, Q	
					Thickness b (m)	Length L (m)	(m3/s)	(m3/yr)
A	St. Marys River	slag	9.4E-06	0.0072	2.26	2765	4.2E-04	1.3E+04
B	West Davignon Diversion	till	9.8E-08	0.0066	0.53	1300	4.5E-07	1.4E+01
C	Baseline Road ditch	slag	9.4E-06	0.0099	1.32	1000	1.2E-04	3.9E+03
C	Baseline Road ditch	sand	4.6E-08	0.0099	2.7	1000	1.2E-06	3.9E+01
C	Baseline Road ditch	TOTAL					1.2E-04	3.9E+03
C	St. Marys River	slag	9.4E-06	0.0099	2.34	708	1.5E-04	4.9E+03
C	St. Marys River	sand	4.6E-08	0.0099	2	708	6.4E-07	2.0E+01
C	St. Marys River	TOTAL					1.5E-04	4.9E+03
D	Bennett Creek	slag	9.4E-06	0.0034	0.87	917	2.5E-05	8.0E+02
D	Bennett Creek	sand	4.6E-08	0.0034	3	917	4.3E-07	1.4E+01
D	Bennett Creek	TOTAL					2.6E-05	8.2E+02
D	Baseline Road ditch	slag	9.4E-06	0.0034	0.67	1417	3.0E-05	9.6E+02
D	Baseline Road ditch	sand	4.6E-08	0.0034	2	1417	4.4E-07	1.4E+01
D	Baseline Road ditch	TOTAL					3.1E-05	9.7E+02
E	St. Marys River	slag	9.4E-06	0.0034	0.99	958	3.0E-05	9.6E+02
E	St. Marys River	sand	4.6E-08	0.0034	2.1	958	3.1E-07	9.9E+00
E	St. Marys River	TOTAL					3.1E-05	9.7E+02
F	Spring Creek	slag	9.4E-06	0.0034	0.42	800	1.1E-05	3.4E+02
F	Spring Creek	sand	4.6E-08	0.0034	3.6	800	4.5E-07	1.4E+01
F	Spring Creek	TOTAL					1.1E-05	3.5E+02
						Total	8.0E-04	2.5E+04

Appendix 9: Groundwater Volumetric Flux Calculations - Algoma 1988, 1989

Maximum Flux

Element No.	Discharge to	Discharge through	Average Hydraulic Cond., K (m/s)	Average Hydraulic Grad., I (-)	Area, A		Flux, Q	
					Thickness b (m)	Length L (m)	(m3/s)	(m3/yr)
A	St. Marys River	slag	2.2E-04	0.01	2.75	2765	1.7E-02	5.3E+05
B	West Davignon Diversion	till	1.0E-05	0.0096	2.07	1300	2.6E-04	8.1E+03
C	Baseline Road ditch	slag	2.2E-04	0.014	1.93	1000	5.9E-03	1.9E+05
C	Baseline Road ditch	sand	6.4E-04	0.014	2.7	1000	2.4E-02	7.6E+05
C	Baseline Road ditch	TOTAL					3.0E-02	9.5E+05
C	St. Marys River	slag	2.2E-04	0.014	3.38	708	7.4E-03	2.3E+05
C	St. Marys River	sand	6.4E-04	0.014	2	708	1.3E-02	4.0E+05
C	St. Marys River	TOTAL					2.0E-02	6.3E+05
D	Bennett Creek	slag	2.2E-04	0.0056	1.48	917	1.7E-03	5.3E+04
D	Bennett Creek	sand	6.4E-04	0.0056	3	917	9.9E-03	3.1E+05
D	Bennett Creek	TOTAL					1.2E-02	3.6E+05
D	Baseline Road ditch	slag	2.2E-04	0.0056	0.85	1417	1.5E-03	4.7E+04
D	Baseline Road ditch	sand	6.4E-04	0.0056	2	1417	1.0E-02	3.2E+05
D	Baseline Road ditch	TOTAL					1.2E-02	3.7E+05
E	St. Marys River	slag	2.2E-04	0.0056	1.695	958	2.0E-03	6.3E+04
E	St. Marys River	sand	6.4E-04	0.0056	2.1	958	7.2E-03	2.3E+05
E	St. Marys River	TOTAL					9.2E-03	2.9E+05
F	Spring Creek	slag	2.2E-04	0.0056	0.96	800	9.5E-04	3.0E+04
F	Spring Creek	sand	6.4E-04	0.0056	3.6	800	1.0E-02	3.3E+05
F	Spring Creek	TOTAL					1.1E-02	3.6E+05
						Total	1.1E-01	3.5E+06

APPENDIX 9

GROUNDWATER FLUX CALCULATIONS - RECHARGE

$R = rA$

where: R = recharge volume

r = infiltration rate

A = surface area

r = 0.4 m

No.	I	Lb (m^2)	Q (m^3/y)	A (m^2)	R (m^3/y)
A	0.008	5,529	697,450	1,216,425	4.9×10^5
B	0.005	2,600	204,984	469,000	1.9×10^5
C	0.008	3,630	457,902	1,114,574	4.4×10^5
D	0.003	5,362	253,691	998,250	4.0×10^5
E	0.002	2,580	81,363	380,545	1.5×10^5
Total			1,695,390		1.6×10^6

MASS FLUX CALCULATIONS

DETAILED CALCULATION OF MASS FLUXES

Area No.	Weighted Average Concentration Formula
St. Marys River	
A	1/4 D1 + 1/4 D2 + 1/5 D3 + 1/5 D4 + 1/10 D5
C	2/7 B5 + 2/7 B4 + 2/7 B3 + 1/7 B2
E	2/7 B5 + 2/7 B4 + 2/7 B3 + 1/7 B2
West Davignon Diversion	
B	3/4 D6 + 1/4 D5
Baseline Road Ditch	
B	A3
C	1/2 A3 + 1/2 A4
D	A5
Bennett Creek	
D	3/4 A6 + 1/4 A7
Spring Creek	
F	B1

Appendix 9: Mass Flux Estimations - Anions and Organics

Weighted Average Concentration Calculations - see Table 9.1 for Formulae

Element No. Discharge To	A SMR	C SMR	E SMR	B WDD	B BRD	C BRD	D BRD	D BC	F SC
DIC	0.7800	5.3300	5.3300	0.0000	-	0.0000	11.0000	0.0000	88.0000
ALKALINITY	318.2600	424.5667	424.5667	542.8000	67.0000	90.2500	302.2500	139.0417	123.0000
SULPHIDE	0.7238	0.0000	0.0000	0.0000	-	0.0000	0.0500	0.0000	0.0000
TOTAL CYANIDE	0.3036	0.0336	0.0336	0.1156	-	0.0000	0.0077	0.0000	0.0010
BROMIDE	0.0000	0.1900	0.1900	0.0000	0.0000	0.0400	0.0900	0.0319	0.0167
CHLORIDE	66.9842	124.6673	124.6673	130.9083	1.2075	14.5204	17.1250	8.7108	13.8339
FLUORIDE	0.8515	0.6676	0.6676	1.6313	0.1650	0.2092	0.5625	0.2169	0.1100
SULPHATE	702.9167	71.7923	71.7923	1080.5625	2.3000	53.3167	9.1250	11.1219	89.5667
NITRATE-N	0.0333	0.0363	0.0363	0.0313	0.0000	0.0200	0.0700	0.0844	1.2333
AMMONIA-N	0.8267	0.0000	0.0000	0.0000	-	0.0000	-	0.0000	1.3480
TOTAL KJELDAHL NITROGEN	4.9702	2.8480	2.8480	8.8750	-	0.1960	17.1800	0.4525	1.8000
TOTAL PHOSPHORUS	0.1572	0.1677	0.1677	0.3606	-	0.0000	0.1050	0.0830	0.0800
						0.0000		0.0000	
DOC	8.9021	3.8966	3.8966	26.5000	1.7800	3.8083	57.5000	4.8838	13.9000
PHENOLS	0.0180	0.0056	0.0056	0.0042	0.0000	0.0006	0.1333	0.0017	0.0988
PCB (ng/L)	0.0000	0.0000	0.0000	0.0000	-	0.0000	-	0.0000	0.0000
OIL AND GREASE	3.0000	1.1600	1.1600	6.5000	0.0000	0.0000	-	2.2500	-
BTX (ug/L)									
BENZENE	6.9833	5.5100	5.5100	47.2500	-	0.0000	0.0000	0.0000	3.4800
TOLUENE	6.1500	11.7450	11.7450	2.2500	-	0.0000	0.0000	7.0000	0.5190
XYLENE	4.7500	0.0000	0.0000	0.0000	-	0.0000	0.0000	24.5000	0.3480
TOTAL BTX	17.5833	23.2000	23.2000	49.5000	-	0.0000	0.0000	31.5000	4318.0000
PAHs (ng/L)									
NAPHTHALENE	8.0717	0.7790	0.7790	0.3625	-	0.0000	7.4667	0.5625	474.0000
ACENAPHTHYLENE	0.3662	0.1190	0.1190	0.0000	-	0.0000	0.0167	0.0000	176.0000
ACENAPHTHENE	0.9784	1.2751	1.2751	0.3600	-	0.0000	0.1833	0.0000	1116.0000
FLUORENE	0.6436	0.8258	0.8258	0.2125	-	0.0000	0.1000	0.0000	915.0000
PHENANTHRENE	1.4862	2.4366	2.4366	0.3125	-	0.0000	3.0667	0.6750	77.5000
ANTHRACENE	0.3669	0.3867	0.3867	0.0800	-	0.0000	0.1100	0.0000	319.5000
FLUORANTHENE	0.9652	2.3042	2.3042	0.0500	-	0.0000	0.7700	0.7500	88.4000
PYRENE	0.8607	2.1477	2.1477	0.0250	-	0.0000	0.4600	0.3750	901.0000
BENZO[a]ANTHRACENE	0.0955	0.2039	0.2039	0.0000	-	0.0000	0.0000	0.0000	367.0000
CHRYSENE	0.1503	0.2788	0.2788	0.0000	-	0.0000	0.0333	0.2250	266.0000
BENZO[b]FLUORANTHENE	0.1475	0.1363	0.1363	0.0000	-	0.0000	0.0000	0.2625	248.5000
BENZO[k]FLUORANTHENE	0.0100	0.0870	0.0870	0.0000	-	0.0000	0.0000	0.0000	134.0000
BENZO[a]PYRENE	0.1367	0.1547	0.1547	0.0000	-	0.0000	0.0000	0.0000	226.0000
PERYLENE	0.0000	0.0290	0.0290	0.0000	-	0.0000	0.0000	0.0000	76.5000
INDENO(1,2,3-C,D)PYRENE	0.0125	0.0580	0.0580	0.0000	-	0.0000	0.0000	0.0000	123.0000
DIBENZO[a,h]ANTHRACENE	0.0000	0.0000	0.0000	0.0000	-	0.0000	0.0000	0.0000	31.0000
BENZO[g,h,i]PERYLENE	0.0000	0.0463	0.0463	0.0000	-	0.0000	0.0000	0.0000	72.0000
TOTAL PAHs	14.2694	11.3691	11.3691	1.3625	-	0.0000	12.2567	1.6750	5296.4000

* SMR = St. Marys River
WDD = West Dedrynon Diversion
Concentrations in mg/L unless otherwise specified

BRD = Baseline Road Ditch
BC = Bennett Creek

SC = Spring Creek

Appendix 9: Mass Flux Estimations - Anions and Organics

CHLORIDE

Average Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	1.3E+05	14.5204	1.9E+03		5.2E+00	
D	Baseline Road ditch	3.8E+04	17.1250	6.5E+02		1.8E+00	
	TOTAL				2.5E+03		7.0E+00
D	Bennett Creek	3.8E+04	8.7108	3.3E+02		9.1E-01	
C	St. Marys River	9.1E+04	124.6873	1.1E+04		3.1E+01	
A	St. Marys River	9.9E+04	65.9642	6.5E+03		1.8E+01	
E	St. Marys River	3.2E+04	124.6873	4.0E+03		1.1E+01	
	TOTAL				2.2E+04		6.0E+01
B	West Davignon Diversion	2.6E+02	130.9083	3.4E+01		9.3E-02	
F	Spring Creek	3.8E+04	13.9333	5.0E+02		1.4E+00	
			Total	2.5E+04		6.9E+01	

Minimum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	3.8E+03	14.5204	5.7E+01		1.6E-01	
D	Baseline Road ditch	9.7E+02	17.1250	1.7E+01		4.6E-02	
	TOTAL				7.3E+01		2.0E-01
D	Bennett Creek	8.2E+02	8.7108	7.1E+00		2.0E-02	
C	St. Marys River	4.9E+03	124.6873	6.1E+02		1.7E+00	
A	St. Marys River	1.3E+04	65.9642	8.6E+02		2.4E+00	
E	St. Marys River	9.7E+02	124.6873	1.2E+02		3.3E-01	
	TOTAL				1.6E+03		4.4E+00
B	West Davignon Diversion	1.4E+01	130.9083	1.8E+00		5.0E-03	
F	Spring Creek	3.5E+02	13.9333	4.9E+00		1.3E-02	
			Total	1.7E+03		4.6E+00	

Maximum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	9.6E+05	14.5204	1.4E+04		3.8E+01	
D	Baseline Road ditch	3.7E+05	17.1250	6.3E+03		1.7E+01	
	TOTAL				2.0E+04		5.5E+01
D	Bennett Creek	3.6E+05	8.7108	3.1E+03		8.6E+00	
C	St. Marys River	6.3E+05	124.6873	7.9E+04		2.2E+02	
A	St. Marys River	5.3E+05	65.9642	3.5E+04		9.5E+01	
E	St. Marys River	2.9E+05	124.6873	3.6E+04		9.9E+01	
	TOTAL				1.5E+05		4.1E+02
B	West Davignon Diversion	8.1E+03	130.9083	1.1E+03		2.9E+00	
F	Spring Creek	3.6E+05	13.9333	5.0E+03		1.4E+01	
			Total	1.8E+05		4.9E+02	

Appendix 9: Mass Flux Estimations - Anions and Organics

TOTAL CYANIDE

Average Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	1.3E+05	0.0000	0.0E+00		0.0E+00	
D	Baseline Road ditch	3.6E+04	0.0077	2.8E-01		8.0E-04	
	TOTAL				2.8E-01		8.0E-04
D	Bennett Creek	3.8E+04	0.0000	0.0E+00		0.0E+00	
C	St. Marys River	9.1E+04	0.0336	3.1E+00		8.4E-03	
A	St. Marys River	9.9E+04	0.3938	3.9E+01		1.1E-01	
E	St. Marys River	3.2E+04	0.0336	1.1E+00		2.9E-03	
	TOTAL				4.3E+01		1.2E-01
B	West Davignon Diversion	2.8E+02	0.1158	3.0E-02		8.2E-06	
F	Spring Creek	3.6E+04	0.0010	3.6E-02		9.9E-05	
			Total	4.3E+01		1.2E-01	

Minimum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	3.9E+03	0.0000	0.0E+00		0.0E+00	
D	Baseline Road ditch	9.7E+02	0.0077	7.4E-03		2.0E-05	
	TOTAL				7.4E-03		2.0E-05
D	Bennett Creek	8.2E+02	0.0000	0.0E+00		0.0E+00	
C	St. Marys River	4.9E+03	0.0336	1.6E-01		4.5E-04	
A	St. Marys River	1.3E+04	0.3938	5.3E+00		1.4E-02	
E	St. Marys River	9.7E+02	0.0336	3.2E-02		8.9E-05	
	TOTAL				5.4E+00		1.5E-02
B	West Davignon Diversion	1.4E+01	0.1158	1.6E-03		4.5E-06	
F	Spring Creek	3.5E+02	0.0010	3.5E-04		9.6E-07	
			Total	5.5E+00		1.5E-02	

Maximum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	9.5E+05	0.0000	0.0E+00		0.0E+00	
D	Baseline Road ditch	3.7E+05	0.0077	2.8E+00		7.8E-03	
	TOTAL				2.8E+00		7.8E-03
D	Bennett Creek	3.8E+05	0.0000	0.0E+00		0.0E+00	
C	St. Marys River	6.3E+05	0.0336	2.1E+01		5.8E-02	
A	St. Marys River	5.3E+05	0.3938	2.1E+02		5.7E-01	
E	St. Marys River	2.8E+05	0.0336	9.7E+00		2.7E-02	
	TOTAL				2.4E+02		6.6E-01
B	West Davignon Diversion	8.1E+03	0.1158	9.4E-01		2.6E-03	
F	Spring Creek	3.6E+05	0.0010	3.6E-01		9.9E-04	
			Total	2.4E+02		6.7E-01	

Appendix 9: Mass Flux Estimations - Anions and Organics

FLUORIDE

Average Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	1.3E+06	0.2092	2.7E+01		7.4E-02	
D	Baseline Road ditch	3.8E+04	0.5625	2.1E+01		5.9E-02	
	TOTAL				4.9E+01		1.3E-01
D	Bennett Creek	3.8E+04	0.2169	8.2E+00		2.3E-02	
C	St. Marys River	9.1E+04	0.6876	6.3E+01		1.7E-01	
A	St. Marys River	9.9E+04	0.8515	8.4E+01		2.3E-01	
E	St. Marys River	3.2E+04	0.6876	2.2E+01		6.0E-02	
	TOTAL				1.6E+02		4.6E-01
B	West Davignon Diversion	2.8E+02	1.6313	4.2E-01		1.2E-03	
F	Spring Creek	3.6E+04	0.1100	4.0E+00		1.1E-02	
			Total	2.3E+02		6.3E-01	

Minimum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	3.9E+03	0.2092	8.2E-01		2.2E-03	
D	Baseline Road ditch	9.7E+02	0.5625	5.5E-01		1.5E-03	
	TOTAL				1.4E+00		3.7E-03
D	Bennett Creek	8.2E+02	0.2169	1.8E-01		4.9E-04	
C	St. Marys River	4.9E+03	0.6876	3.4E+00		9.2E-03	
A	St. Marys River	1.3E+04	0.8515	1.1E+01		3.1E-02	
E	St. Marys River	9.7E+02	0.6876	6.6E-01		1.8E-03	
	TOTAL				1.6E+01		4.2E-02
B	West Davignon Diversion	1.4E+01	1.6313	2.3E-02		6.3E-05	
F	Spring Creek	3.6E+02	0.1100	3.9E-02		1.1E-04	
			Total	1.7E+01		4.7E-02	

Maximum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	9.5E+05	0.2092	2.0E+02		5.4E-01	
D	Baseline Road ditch	3.7E+05	0.5625	2.1E+02		5.7E-01	
	TOTAL				4.1E+02		1.1E+00
D	Bennett Creek	3.6E+05	0.2169	7.8E+01		2.1E-01	
C	St. Marys River	8.3E+05	0.6876	4.3E+02		1.2E+00	
A	St. Marys River	5.3E+05	0.8515	4.5E+02		1.2E+00	
E	St. Marys River	2.9E+05	0.6876	2.0E+02		5.5E-01	
	TOTAL				1.2E+03		3.0E+00
B	West Davignon Diversion	8.1E+03	1.6313	1.3E+01		3.6E-02	
F	Spring Creek	3.6E+05	0.1100	4.0E+01		1.1E-01	
			Total	1.6E+03		4.4E+00	

Appendix 9: Mass Flux Estimations - Anions and Organics

SULPHATE

Average Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	1.3E+05	53.3167	6.9E+03		1.9E+01	
D	Baseline Road ditch	3.8E+04	9.1250	3.5E+02		9.5E-01	
	TOTAL				7.3E+03		2.0E+01
D	Bennett Creek	3.8E+04	11.1219	4.2E+02		1.2E+00	
C	St. Marys River	9.1E+04	71.7923	6.5E+03		1.8E+01	
A	St. Marys River	9.8E+04	702.9167	7.0E+04		1.9E+02	
E	St. Marys River	3.2E+04	71.7923	2.3E+03		6.3E+00	
	TOTAL				7.9E+04		2.1E+02
B	West Davignon Diversion	2.8E+02	1080.5825	2.8E+02		7.7E-01	
F	Spring Creek	3.8E+04	29.5667	1.1E+03		2.9E+00	
			Total	8.7E+04		2.4E+02	

Minimum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	3.8E+03	53.3167	2.1E+02		5.7E-01	
D	Baseline Road ditch	9.7E+02	9.1250	8.9E+00		2.4E-02	
	TOTAL				2.2E+02		6.0E-01
D	Bennett Creek	8.2E+02	11.1219	9.1E+00		2.5E-02	
C	St. Marys River	4.9E+03	71.7923	3.5E+02		9.6E-01	
A	St. Marys River	1.3E+04	702.9167	9.4E+03		2.6E+01	
E	St. Marys River	9.7E+02	71.7923	6.9E+01		1.9E-01	
	TOTAL				9.8E+03		2.7E+01
B	West Davignon Diversion	1.4E+01	1080.5825	1.5E+01		4.2E-02	
F	Spring Creek	3.8E+02	29.5667	1.0E+01		2.8E-02	
			Total	1.0E+04		2.8E+01	

Maximum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	9.6E+05	53.3167	5.1E+04		1.4E+02	
D	Baseline Road ditch	3.7E+05	9.1250	3.4E+03		9.3E+00	
	TOTAL				5.4E+04		1.5E+02
D	Bennett Creek	3.6E+05	11.1219	4.0E+03		1.1E+01	
C	St. Marys River	6.3E+05	71.7923	4.5E+04		1.2E+02	
A	St. Marys River	5.2E+05	702.9167	3.7E+05		1.0E+03	
E	St. Marys River	2.9E+05	71.7923	2.1E+04		5.7E+01	
	TOTAL				4.4E+05		1.2E+03
B	West Davignon Diversion	8.1E+03	1080.5825	8.8E+03		2.4E+01	
F	Spring Creek	3.8E+05	29.5667	1.1E+04		2.9E+01	
			Total	5.1E+05		1.4E+03	

Appendix 9: Mass Flux Estimations - Anions and Organics

NITRATE-N

Average Flux

Element	No.	Discharge to	Flux,Q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C		Baseline Road ditch						
D		Baseline Road ditch	1.3E+05	0.0200	2.6E+00		7.1E-03	
		TOTAL	3.8E+04	0.0700	2.7E+00		7.3E-03	
D		Bennett Creek				5.3E+00		1.4E-02
C		St. Marys River	3.8E+04	0.0244	9.3E-01		2.5E-03	
A		St. Marys River	9.1E+04	0.0363	3.3E+00		9.0E-03	
E		St. Marys River	9.9E+04	0.0333	3.3E+00		9.0E-03	
		TOTAL	3.2E+04	0.0363	1.2E+00		3.2E-03	
B		West Davignon Diversion				8.7E+00		2.1E-02
F		Spring Creek	2.6E+02	0.0313	8.1E-03		2.2E-05	
			3.6E+04	1.2333	4.4E+01		1.2E-01	
				Total	5.8E+01		1.6E-01	

Minimum Flux

Element	No.	Discharge to	Flux,Q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C		Baseline Road ditch						
D		Baseline Road ditch	3.9E+03	0.0200	7.8E-02		2.1E-04	
		TOTAL	9.7E+02	0.0700	6.8E-02		1.9E-04	
D		Bennett Creek				1.5E-01		4.0E-04
C		St. Marys River	8.2E+02	0.0244	2.0E-02		5.5E-05	
A		St. Marys River	4.9E+03	0.0363	1.8E-01		4.8E-04	
E		St. Marys River	1.2E+04	0.0333	4.4E-01		1.2E-03	
		TOTAL	9.7E+02	0.0363	3.5E-02		9.6E-05	
B		West Davignon Diversion				6.6E-01		1.8E-03
F		Spring Creek	1.4E+01	0.0313	4.4E-04		1.2E-06	
			3.5E+02	1.2333	4.3E-01		1.2E-03	
				Total	1.3E+00		3.4E-03	

Maximum Flux

Element	No.	Discharge to	Flux,Q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C		Baseline Road ditch						
D		Baseline Road ditch	9.6E+05	0.0200	1.9E+01		5.2E-02	
		TOTAL	3.7E+05	0.0700	2.6E+01		7.1E-02	
D		Bennett Creek				4.5E+01		1.2E-01
C		St. Marys River	3.8E+05	0.0244	8.8E+00		2.4E-02	
A		St. Marys River	6.3E+05	0.0363	2.3E+01		6.3E-02	
E		St. Marys River	5.3E+05	0.0333	1.8E+01		4.8E-02	
		TOTAL	2.9E+05	0.0363	1.1E+01		2.9E-02	
B		West Davignon Diversion				8.0E+01		1.4E-01
F		Spring Creek	8.1E+03	0.0313	2.5E-01		7.0E-04	
			3.6E+05	1.2333	4.4E+02		1.2E+00	
				Total	5.5E+02		1.5E+00	

Appendix 9: Mass Flux Estimations - Anions and Organics

TOTAL KJELDAHL NITROGEN

Average Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	1.3E+05	0.1950	2.5E+01		6.9E-02	
D	Baseline Road ditch	3.8E+04	17.1500	6.5E+02		1.8E+00	
	TOTAL				6.8E+02		1.9E+00
D	Bennett Creek						
C	St. Marys River	3.8E+04	0.4525	1.7E+01		4.7E-02	
A	St. Marys River	9.1E+04	2.8480	2.6E+02		7.1E-01	
E	St. Marys River	9.9E+04	4.9702	4.9E+02		1.3E+00	
	TOTAL	3.2E+04	2.8480	9.1E+01		2.5E-01	
B	West Davignon Diversion				6.6E+02		2.3E+00
F	Spring Creek	2.6E+02	8.8750	2.3E+00		6.3E-03	
		3.6E+04	1.8000	6.5E+01		1.8E-01	
			Total	1.6E+03		4.4E+00	

Minimum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch						
D	Baseline Road ditch	3.9E+03	0.1950	7.6E-01		2.1E-03	
	TOTAL	9.7E+02	17.1500	1.7E+01		4.6E-02	
D	Bennett Creek				1.7E+01		4.6E-02
C	St. Marys River	8.2E+02	0.4525	3.7E-01		1.0E-03	
A	St. Marys River	4.9E+03	2.8480	1.4E+01		3.8E-02	
E	St. Marys River	1.3E+04	4.9702	6.6E+01		1.8E-01	
	TOTAL	9.7E+02	2.8480	2.8E+00		7.5E-03	
B	West Davignon Diversion				8.3E+01		2.3E-01
F	Spring Creek	1.4E+01	8.8750	1.2E-01		3.4E-04	
		3.5E+02	1.8000	6.3E-01		1.7E-03	
			Total	1.0E+02		2.8E-01	

Maximum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch						
D	Baseline Road ditch	9.5E+05	0.1950	1.9E+02		5.1E-01	
	TOTAL	3.7E+05	17.1500	6.3E+03		1.7E+01	
D	Bennett Creek				6.6E+03		1.8E+01
C	St. Marys River	3.8E+05	0.4525	1.6E+02		4.5E-01	
A	St. Marys River	6.3E+05	2.8480	1.8E+03		4.9E+00	
E	St. Marys River	5.3E+05	4.9702	2.6E+03		7.2E+00	
	TOTAL	2.9E+05	2.8480	8.3E+02		2.3E+00	
B	West Davignon Diversion				5.4E+03		1.4E+01
F	Spring Creek	8.1E+03	8.8750	7.2E+01		2.0E-01	
		3.6E+05	1.8000	6.5E+02		1.8E+00	
			Total	1.3E+04		3.5E+01	

Appendix 9: Mass Flux Estimations - Anions and Organics

TOTAL PHOSPHOROUS

Average Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	1.3E+05	0.0000	0.0E+00		0.0E+00	
D	Baseline Road ditch	3.8E+04	0.1030	3.9E+00		1.1E-02	
	TOTAL				3.9E+00		1.1E-02
D	Bennett Creek	3.8E+04	0.0330	1.3E+00		3.4E-03	
C	St. Marys River	9.1E+04	0.1677	1.5E+01		4.2E-02	
A	St. Marys River	9.9E+04	0.1572	1.6E+01		4.3E-02	
E	St. Marys River	3.2E+04	0.1677	5.4E+00		1.5E-02	
	TOTAL				2.7E+01		9.9E-02
B	West Davignon Diversion	2.8E+02	0.3508	9.1E-02		2.5E-04	
F	Spring Creek	3.6E+04	0.0500	1.8E+00		4.9E-03	
			Total	4.3E+01		1.2E-01	

Minimum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	3.9E+03	0.0000	0.0E+00		0.0E+00	
D	Baseline Road ditch	9.7E+02	0.1030	1.0E-01		2.7E-04	
	TOTAL				1.0E-01		2.7E-04
D	Bennett Creek	8.2E+02	0.0330	2.7E-02		7.4E-05	
C	St. Marys River	4.9E+03	0.1677	8.2E-01		2.2E-03	
A	St. Marys River	1.3E+04	0.1572	2.1E+00		5.7E-03	
E	St. Marys River	9.7E+02	0.1677	1.6E-01		4.4E-04	
	TOTAL				3.1E+00		8.4E-03
B	West Davignon Diversion	1.4E+01	0.3508	4.9E-03		1.4E-05	
F	Spring Creek	3.6E+02	0.0500	1.8E-02		4.8E-05	
			Total	3.2E+00		8.8E-03	

Maximum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	9.5E+05	0.0000	0.0E+00		0.0E+00	
D	Baseline Road ditch	3.7E+05	0.1030	3.8E+01		1.0E-01	
	TOTAL				3.8E+01		1.0E-01
D	Bennett Creek	3.6E+05	0.0330	1.2E+01		3.3E-02	
C	St. Marys River	6.2E+05	0.1677	1.1E+02		2.9E-01	
A	St. Marys River	5.3E+05	0.1572	8.3E+01		2.3E-01	
E	St. Marys River	2.9E+05	0.1677	4.9E+01		1.3E-01	
	TOTAL				2.5E+02		6.5E-01
B	West Davignon Diversion	8.1E+03	0.3508	2.9E+00		7.8E-03	
F	Spring Creek	3.6E+05	0.0500	1.8E+01		4.9E-02	
			Total	3.1E+02		8.4E-01	

Appendix 9: Mass Flux Estimations - Anions and Organics

PHENOLS

Average Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	1.3E+05	0.0005	6.5E-02		1.8E-04	
D	Baseline Road ditch	3.8E+04	0.1333	5.1E+00		1.4E-02	
	TOTAL				5.1E+00		1.4E-02
D	Bennett Creek	3.8E+04	0.0017	6.4E-02		1.8E-04	
C	St. Marys River	9.1E+04	0.0056	5.1E-01		1.4E-03	
A	St. Marys River	9.9E+04	0.0180	1.8E+00		4.9E-03	
E	St. Marys River	3.2E+04	0.0056	1.8E-01		4.9E-04	
	TOTAL				2.5E+00		6.8E-03
B	West Davignon Diversion	2.8E+02	0.0042	1.1E-03		3.0E-06	
F	Spring Creek	3.8E+04	0.0668	2.4E+00		6.6E-03	
			Total	1.0E+01		2.8E-02	

Minimum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	3.9E+03	0.0005	2.0E-03		5.4E-06	
D	Baseline Road ditch	9.7E+02	0.1333	1.3E-01		3.5E-04	
	TOTAL				1.3E-01		3.6E-04
D	Bennett Creek	8.2E+02	0.0017	1.4E-03		3.8E-06	
C	St. Marys River	4.9E+03	0.0056	2.7E-02		7.5E-05	
A	St. Marys River	1.3E+04	0.0180	2.4E-01		6.6E-04	
E	St. Marys River	9.7E+02	0.0056	5.4E-03		1.5E-05	
	TOTAL				2.7E-01		7.5E-04
B	West Davignon Diversion	1.4E+01	0.0042	5.9E-05		1.6E-07	
F	Spring Creek	3.5E+02	0.0668	2.3E-02		6.4E-05	
			Total	4.3E-01		1.2E-03	

Maximum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	9.5E+05	0.0005	4.8E-01		1.3E-03	
D	Baseline Road ditch	3.7E+05	0.1333	4.9E+01		1.4E-01	
	TOTAL				5.0E+01		1.4E-01
D	Bennett Creek	3.6E+05	0.0017	6.1E-01		1.7E-03	
C	St. Marys River	6.3E+05	0.0056	3.5E+00		9.7E-03	
A	St. Marys River	5.3E+05	0.0180	9.5E+00		2.6E-02	
E	St. Marys River	2.9E+05	0.0056	1.6E+00		4.5E-03	
	TOTAL				1.5E+01		4.0E-02
B	West Davignon Diversion	8.1E+03	0.0042	3.4E-02		9.3E-05	
F	Spring Creek	3.6E+05	0.0668	2.4E+01		6.6E-02	
			Total	8.9E+01		2.4E-01	

Appendix 9: Mass Flux Estimations - Anions and Organics

TOTAL BTX

Average Flux

Element	No.	Discharge to	Flux,Q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
	C	Baseline Road ditch			0.0E+00		0.0E+00	
	D	Baseline Road ditch	1.3E+05	0.0000	0.0E+00		0.0E+00	
		TOTAL	3.8E+04	0.0000		0.0E+00		0.0E+00
	D	Bennett Creek			1.2E+00		3.3E-03	
	C	St. Marys River	3.8E+04	31.5000	2.1E+00		5.8E-03	
	A	St. Marys River	9.1E+04	23.2000	1.7E+00		4.8E-03	
	E	St. Marys River	9.9E+04	17.5833	7.4E-01		2.0E-03	
		TOTAL	3.2E+04	23.2000		5.8E+00		1.3E-02
	B	West Davignon Diversion			1.3E-02		3.5E-05	
	F	Spring Creek	2.8E+02	49.5000	1.6E+02		4.3E-01	
			3.6E+04	4318.0000 Total	1.6E+02		4.4E-01	

Minimum Flux

Element	No.	Discharge to	Flux,Q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
	C	Baseline Road ditch			0.0E+00		0.0E+00	
	D	Baseline Road ditch	3.9E+03	0.0000	0.0E+00		0.0E+00	
		TOTAL	9.7E+02	0.0000		0.0E+00		0.0E+00
	D	Bennett Creek			2.6E-02		7.1E-05	
	C	St. Marys River	8.2E+02	31.5000	1.1E-01		3.1E-04	
	A	St. Marys River	4.9E+03	23.2000	2.3E-01		6.4E-04	
	E	St. Marys River	1.3E+04	17.5833	2.2E-02		6.1E-05	
		TOTAL	9.7E+02	23.2000		4.0E-01		1.0E-03
	B	West Davignon Diversion			7.0E-04		1.9E-06	
	F	Spring Creek	1.4E+01	49.5000	1.5E+00		4.1E-03	
			3.5E+02	4318.0000 Total	1.9E+00		5.2E-03	

Maximum Flux

Element	No.	Discharge to	Flux,Q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
	C	Baseline Road ditch			0.0E+00		0.0E+00	
	D	Baseline Road ditch	9.5E+05	0.0000	0.0E+00		0.0E+00	
		TOTAL	3.7E+05	0.0000		0.0E+00		0.0E+00
	D	Bennett Creek			1.1E+01		3.1E-02	
	C	St. Marys River	3.6E+05	31.5000	1.5E+01		4.0E-02	
	A	St. Marys River	6.3E+05	23.2000	9.3E+00		2.5E-02	
	E	St. Marys River	5.3E+05	17.5833	6.7E+00		1.8E-02	
		TOTAL	2.9E+05	23.2000		4.2E+01		8.4E-02
	B	West Davignon Diversion			4.0E-01		1.1E-03	
	F	Spring Creek	6.1E+03	49.5000	1.6E+00		4.3E+00	
			3.6E+05	4318.0000 Total	1.6E+03		4.4E+00	

Appendix 9: Mass Flux Estimations - Anions and Organics

TOTAL PAH

Average Flux

Element No.	Discharge to	Flux,Q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	1.3E+05	0.0000	0.0E+00		0.0E+00	
D	Baseline Road ditch	3.8E+04	12.2567	4.7E-01		1.3E-03	
	TOTAL				4.7E-01		1.3E-03
D	Bennett Creek					1.6E-04	
C	St. Marys River	3.8E+04	1.5750	6.0E-02		2.8E-03	
A	St. Marys River	8.1E+04	11.3591	1.0E+00		3.9E-03	
E	St. Marys River	9.9E+04	14.2694	1.4E+00		1.00E-03	
	TOTAL	3.2E+04	11.3591	3.6E-01			
B	West Davignon Diversion				2.9E+00	9.7E-07	7.7E-03
F	Spring Creek	2.8E+02	1.3625	3.5E-04		5.2E-01	
		3.8E+04	5295.4000	1.9E+02		5.3E-01	
			Total	1.9E+02			

Minimum Flux

Element No.	Discharge to	Flux,Q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	3.9E+03	0.0000	0.0E+00		0.0E+00	
D	Baseline Road ditch	9.7E+02	12.2567	1.2E-02		3.3E-05	
	TOTAL				1.2E-02		3.3E-05
D	Bennett Creek					3.5E-06	
C	St. Marys River	8.2E+02	1.5750	1.3E-03		1.6E-04	
A	St. Marys River	4.9E+03	11.3591	5.5E-02		5.2E-04	
E	St. Marys River	1.2E+04	14.2694	1.9E-01		3.0E-05	
	TOTAL	9.7E+02	11.3591	1.1E-02			
B	West Davignon Diversion				2.6E-01	5.2E-06	7.0E-04
F	Spring Creek	1.4E+01	1.3625	1.9E-05		5.1E-03	
		3.5E+02	5295.4000	1.9E+00		5.6E-03	
			Total	2.1E+00			

Maximum Flux

Element No.	Discharge to	Flux,Q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	9.6E+05	0.0000	0.0E+00		0.0E+00	
D	Baseline Road ditch	3.7E+05	12.2567	4.6E+00		1.2E-02	
	TOTAL				4.6E+00		1.2E-02
D	Bennett Creek					1.6E-03	
C	St. Marys River	3.6E+05	1.5750	5.7E-01		2.0E-02	
A	St. Marys River	6.3E+05	11.3591	7.2E+00		2.1E-02	
E	St. Marys River	5.3E+05	14.2694	7.5E+00		9.0E-03	
	TOTAL	2.6E+05	11.3591	3.3E+00			
B	West Davignon Diversion				1.9E+01	3.0E-05	4.9E-02
F	Spring Creek	8.1E+03	1.3625	1.1E-02		5.2E+00	
		3.6E+05	5295.4000	1.9E+03		6.3E+00	
			Total	1.9E+03			

Appendix 9: Mass Flux Estimates - Metals

Weighted Average concentrations - see Table 9.1 for Formulae

Element No. / Discharge To	A SMR	C SMR	E SMR	B WDD	B BRD	C BRD	D BRD	D BC	F SC
ZINC	0.0065	0.0093	0.0093	0.0258	0.0000	0.0075	0.0000	0.0033	0.0000
CADMIUM	0.0011	0.0003	0.0003	0.0003	0.0010	0.0006	0.0002	0.0001	0.0006
MANGANESE	0.2835	0.0331	0.0331	2.1450	0.1000	0.4550	0.0700	0.0883	0.1850
COBALT	0.0108	0.0089	0.0089	0.0125	0.0000	0.0025	0.0000	0.0000	0.0000
COPPER	0.0031	0.0014	0.0014	0.0063	0.0050	0.0025	0.0067	0.0063	0.0000
IRON	5.4913	0.1312	0.1312	31.6117	0.2000	5.1750	0.5800	0.0833	0.7700
LEAD	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CHROMIUM	0.0171	0.0103	0.0103	0.0204	0.0000	0.0050	0.0033	0.0000	0.0000
NICKEL	0.0073	0.0030	0.0030	0.0142	0.0000	0.0000	0.0033	0.0000	0.0000
BERYLLIUM	0.0000	0.0000	0.0000	0.0000	-	0.0000	0.0000	0.0000	0.0000
MOLYBDENUM	0.0310	0.0150	0.0150	0.0263	-	0.0050	0.0200	0.0013	0.0000
CALCIUM	304.8500	214.8408	214.8408	370.0000	15.2000	30.8500	101.2500	45.2667	37.7500
VANADIUM	0.0444	0.0222	0.0222	0.0388	-	0.0000	0.0233	0.0075	0.0000
ALUMINUM	0.4078	0.3897	0.3897	0.3900	-	0.0600	0.5600	0.2000	0.1400
MAGNESIUM	5.8771	2.5356	2.5356	93.2500	2.0000	6.9250	2.0500	7.1042	1.8125
BARIUM	0.0915	0.2476	0.2476	0.0813	-	0.0150	0.0467	0.0338	0.0500
POTASSIUM	197.6417	49.1350	49.1350	207.0000	1.6500	3.5500	9.7000	1.8000	5.4250
STRONTIUM	1.1988	0.8341	0.8341	1.3288	-	0.2250	0.3200	0.1725	0.0800
SODIUM	71.7000	43.4521	43.4521	153.5000	15.0000	18.2500	61.2500	12.1250	14.8750
ARSENIC (ug/L)	0.5333	0.0000	0.0000	0.0000	-	0.0000	-	0.0000	7.0000
SELENIUM (ug/L)	0.1333	0.0000	0.0000	0.0000	-	0.0000	-	0.0000	0.0000
MERCURY (ug/L)	0.0105	0.0000	0.0000	0.0000	-	0.0000	-	0.0000	0.0000

* SMR = St. Marys River
WDD = West Davignon Diversion
BRD = Baseline Road Ditch
BC = Bennett Creek
SC = Spring Creek
Concentrations in mg/L unless otherwise specified

Appendix 9: Mass Flux Estimates - Metals

ZINC

Average Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/d_y)	
C	Baseline Road ditch	1.3E+05	0.0075	9.8E-01		2.7E-03	
D	Baseline Road ditch	3.8E+04	0.0000	0.0E+00		0.0E+00	
	TOTAL				9.8E-01		2.7E-03
D	Bennett Creek	1.8E+04	0.0033	1.3E-01		3.5E-04	
C	St. Marys River	8.1E+04	0.0093	8.4E-01		2.3E-03	
A	St. Marys River	9.9E+04	0.0065	6.4E-01		1.8E-03	
E	St. Marys River	3.2E+04	0.0093	3.0E-01		8.1E-04	
	TOTAL				1.8E+00		4.9E-03
B	West Davignon Diversion	2.6E+02	0.0258	6.7E-03		1.8E-05	
F	Spring Creek	3.6E+04	0.0000	0.0E+00		0.0E+00	
			Total	2.9E+00		7.9E-03	

Minimum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	3.9E+03	0.0075	2.9E-02		8.0E-05	
D	Baseline Road ditch	9.7E+02	0.0000	0.0E+00		0.0E+00	
	TOTAL				2.9E-02		8.0E-05
D	Bennett Creek	8.2E+02	0.0033	2.7E-03		7.5E-06	
C	St. Marys River	4.9E+03	0.0093	4.5E-02		1.2E-04	
A	St. Marys River	1.3E+04	0.0065	8.7E-02		2.4E-04	
E	St. Marys River	9.7E+02	0.0093	8.9E-03		2.5E-05	
	TOTAL				1.4E-01		3.9E-04
B	West Davignon Diversion	1.4E+01	0.0258	3.6E-04		9.9E-07	
F	Spring Creek	3.5E+02	0.0000	0.0E+00		0.0E+00	
			Total	1.7E-01		4.7E-04	

Maximum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	9.5E+05	0.0075	7.1E+00		2.0E-02	
D	Baseline Road ditch	3.7E+05	0.0000	0.0E+00		0.0E+00	
	TOTAL				7.1E+00		2.0E-02
D	Bennett Creek	3.6E+05	0.0033	1.2E+00		3.3E-03	
C	St. Marys River	6.3E+05	0.0093	5.8E+00		1.6E-02	
A	St. Marys River	5.3E+05	0.0065	3.4E+00		9.4E-03	
E	St. Marys River	2.9E+05	0.0093	2.7E+00		7.4E-03	
	TOTAL				1.2E+01		3.3E-02
B	West Davignon Diversion	8.1E+03	0.0258	2.1E-01		5.8E-04	
F	Spring Creek	3.6E+05	0.0000	0.0E+00		0.0E+00	
			Total	2.0E+01		5.6E-02	

Appendix 9: Mass Flux Estimates - Metals

CADMIUM

Average Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	1.3E+05	0.0006	7.2E-02		2.0E-04	
D	Baseline Road ditch	3.8E+04	0.0002	6.3E-03		1.7E-05	
	TOTAL				7.8E-02		2.1E-04
D	Bennett Creek	3.8E+04	0.0001	5.1E-03		1.4E-05	
C	St. Marys River	9.1E+04	0.0003	2.6E-02		7.1E-05	
A	St. Marys River	9.9E+04	0.0011	1.1E-01		2.9E-04	
E	St. Marys River	3.2E+04	0.0003	9.1E-03		2.5E-05	
	TOTAL				1.5E-01		3.9E-04
B	West Davignon Diversion	2.6E+02	0.0003	6.9E-05		1.9E-07	
F	Spring Creek	3.6E+04	0.0006	2.2E-02		5.9E-05	
			Total	2.5E-01		6.7E-04	

Minimum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	3.9E+03	0.0006	2.2E-03		5.9E-06	
D	Baseline Road ditch	9.7E+02	0.0002	1.6E-04		4.4E-07	
	TOTAL				2.3E-03		6.3E-06
D	Bennett Creek	8.2E+02	0.0001	1.1E-04		3.0E-07	
C	St. Marys River	4.9E+03	0.0003	1.4E-03		3.8E-06	
A	St. Marys River	1.3E+04	0.0011	1.4E-02		3.9E-05	
E	St. Marys River	9.7E+02	0.0003	2.7E-04		7.5E-07	
	TOTAL				1.6E-02		4.4E-05
B	West Davignon Diversion	1.4E+01	0.0003	3.7E-06		1.0E-08	
F	Spring Creek	3.5E+02	0.0006	2.1E-04		5.8E-07	
			Total	1.9E-02		5.1E-05	

Maximum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	9.5E+05	0.0006	5.2E-01		1.4E-03	
D	Baseline Road ditch	3.7E+05	0.0002	6.2E-02		1.7E-04	
	TOTAL				5.8E-01		1.6E-03
D	Bennett Creek	3.6E+05	0.0001	4.8E-02		1.3E-04	
C	St. Marys River	6.3E+05	0.0003	1.8E-01		4.9E-04	
A	St. Marys River	5.3E+05	0.0011	5.6E-01		1.5E-03	
E	St. Marys River	2.9E+05	0.0003	8.2E-02		2.2E-04	
	TOTAL				8.7E-01		2.3E-03
B	West Davignon Diversion	8.1E+03	0.0003	2.2E-03		6.0E-06	
F	Spring Creek	3.6E+05	0.0006	2.2E-01		5.9E-04	
			Total	1.7E+00		4.6E-03	

Appendix 9: Mass Flux Estimates - Metals

MANGANESE

Average Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	1.3E+05	0.4550	5.9E+01		1.6E-01	
D	Baseline Road ditch	3.8E+04	0.0700	2.7E+00		7.3E-03	
	TOTAL				6.2E+01		1.7E-01
D	Bennett Creek	3.8E+04	0.0883	3.4E+00		9.2E-03	
C	St. Marys River	9.1E+04	0.0331	3.0E+00		8.3E-03	
A	St. Marys River	9.9E+04	0.2835	2.8E+01		7.7E-02	
E	St. Marys River	3.2E+04	0.0331	1.1E+00		2.9E-03	
	TOTAL				3.5E+01		8.8E-02
B	West Davignon Diversion	2.6E+02	2.1450	5.6E-01		1.5E-03	
F	Spring Creek	3.6E+04	0.1850	6.7E+00		1.8E-02	
			Total	1.0E+02		2.9E-01	

Minimum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	3.9E+03	0.4550	1.8E+00		4.9E-03	
D	Baseline Road ditch	9.7E+02	0.0700	6.8E-02		1.9E-04	
	TOTAL				1.8E+00		5.1E-03
D	Bennett Creek	8.2E+02	0.0883	7.2E-02		2.0E-04	
C	St. Marys River	4.9E+03	0.0331	1.6E-01		4.4E-04	
A	St. Marys River	1.3E+04	0.2835	3.8E+00		1.0E-02	
E	St. Marys River	9.7E+02	0.0331	3.2E-02		8.8E-05	
	TOTAL				4.0E+00		1.1E-02
B	West Davignon Diversion	1.4E+01	2.1450	3.0E-02		8.3E-05	
F	Spring Creek	3.5E+02	0.1850	6.5E-02		1.8E-04	
			Total	6.0E+00		1.6E-02	

Maximum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	9.5E+05	0.4550	4.3E+02		1.2E+00	
D	Baseline Road ditch	3.7E+05	0.0700	2.6E+01		7.1E-02	
	TOTAL				4.6E+02		1.3E+00
D	Bennett Creek	3.6E+05	0.0883	3.2E+01		8.7E-02	
C	St. Marys River	6.3E+05	0.0331	2.1E+01		5.7E-02	
A	St. Marys River	5.3E+05	0.2835	1.5E+02		4.1E-01	
E	St. Marys River	2.9E+05	0.0331	9.6E+00		2.6E-02	
	TOTAL				2.1E+02		4.9E-01
B	West Davignon Diversion	8.1E+03	2.1450	1.7E+01		4.8E-02	
F	Spring Creek	3.6E+05	0.1850	6.7E+01		1.8E-01	
			Total	7.5E+02		2.1E+00	

Appendix 9: Mass Flux Estimates - Metals

COBALT

Average Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	1.3E+05	0.0025	3.3E-01		8.9E-04	
D	Baseline Road ditch	3.8E+04	0.0000	0.0E+00		0.0E+00	
	TOTAL				3.3E-01		8.9E-04
D	Bennett Creek	3.8E+04	0.0000	0.0E+00		0.0E+00	
C	St. Marys River	9.1E+04	0.0089	8.1E-01		2.2E-03	
A	St. Marys River	9.9E+04	0.0108	1.1E+00		2.9E-03	
E	St. Marys River	3.2E+04	0.0089	2.9E-01		7.8E-04	
	TOTAL				2.2E+00		6.0E-03
B	West Davignon Diversion	2.6E+02	0.0125	3.3E-03		8.9E-06	
F	Spring Creek	3.6E+04	0.0000	0.0E+00		0.0E+00	
			Total	2.5E+00		6.9E-03	

Minimum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	3.9E+03	0.0025	9.8E-03		2.7E-05	
D	Baseline Road ditch	9.7E+02	0.0000	0.0E+00		0.0E+00	
	TOTAL				9.8E-03		2.7E-05
D	Bennett Creek	8.2E+02	0.0000	0.0E+00		0.0E+00	
C	St. Marys River	4.9E+03	0.0089	4.4E-02		1.2E-04	
A	St. Marys River	1.3E+04	0.0108	1.4E-01		4.0E-04	
E	St. Marys River	9.7E+02	0.0089	8.6E-03		2.4E-05	
	TOTAL				2.0E-01		5.4E-04
B	West Davignon Diversion	1.4E+01	0.0125	1.8E-04		4.8E-07	
F	Spring Creek	3.5E+02	0.0000	0.0E+00		0.0E+00	
			Total	2.1E-01		5.7E-04	

Maximum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	9.5E+05	0.0025	2.4E+00		6.5E-03	
D	Baseline Road ditch	3.7E+05	0.0000	0.0E+00		0.0E+00	
	TOTAL				2.4E+00		6.5E-03
D	Bennett Creek	3.6E+05	0.0000	0.0E+00		0.0E+00	
C	St. Marys River	6.3E+05	0.0089	5.6E+00		1.5E-02	
A	St. Marys River	5.3E+05	0.0108	5.7E+00		1.6E-02	
E	St. Marys River	2.9E+05	0.0089	2.6E+00		7.1E-03	
	TOTAL				1.4E+01		3.8E-02
B	West Davignon Diversion	8.1E+03	0.0125	1.0E-01		2.8E-04	
F	Spring Creek	3.6E+05	0.0000	0.0E+00		0.0E+00	
			Total	1.6E+01		4.5E-02	

Appendix 9: Mass Flux Estimates - Metals

COPPER

Average Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	1.3E+05	0.0025	3.3E-01		8.9E-04	
D	Baseline Road ditch	3.8E+04	0.0067	2.5E-01		6.9E-04	
	TOTAL				5.8E-01		1.6E-03
D	Bennett Creek	3.8E+04	0.0063	2.4E-01		6.5E-04	
C	St. Marys River	9.1E+04	0.0014	1.3E-01		3.5E-04	
A	St. Marys River	9.9E+04	0.0031	3.1E-01		8.4E-04	
E	St. Marys River	3.2E+04	0.0014	4.5E-02		1.2E-04	
	TOTAL				7.1E-01		1.3E-03
B	West Davignon Diversion	2.6E+02	0.0063	1.6E-03		4.5E-06	
F	Spring Creek	3.6E+04	0.0000	0.0E+00		0.0E+00	
			Total	1.3E+00		3.5E-03	

Minimum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	3.9E+03	0.0025	9.8E-03		2.7E-05	
D	Baseline Road ditch	9.7E+02	0.0067	6.5E-03		1.8E-05	
	TOTAL				1.6E-02		4.5E-05
D	Bennett Creek	8.2E+02	0.0063	5.1E-03		1.4E-05	
C	St. Marys River	4.9E+03	0.0014	6.8E-03		1.9E-05	
A	St. Marys River	1.3E+04	0.0031	4.1E-02		1.1E-04	
E	St. Marys River	9.7E+02	0.0014	1.4E-03		3.7E-06	
	TOTAL				5.4E-02		1.4E-04
B	West Davignon Diversion	1.4E+01	0.0063	8.8E-05		2.4E-07	
F	Spring Creek	3.5E+02	0.0000	0.0E+00		0.0E+00	
			Total	7.1E-02		1.9E-04	

Maximum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	9.5E+05	0.0025	2.4E+00		6.5E-03	
D	Baseline Road ditch	3.7E+05	0.0067	2.5E+00		6.8E-03	
	TOTAL				4.8E+00		1.3E-02
D	Bennett Creek	3.6E+05	0.0063	2.3E+00		6.2E-03	
C	St. Marys River	6.3E+05	0.0014	8.8E-01		2.4E-03	
A	St. Marys River	5.3E+05	0.0031	1.6E+00		4.5E-03	
E	St. Marys River	2.9E+05	0.0014	4.1E-01		1.1E-03	
	TOTAL				5.2E+00		8.0E-03
B	West Davignon Diversion	8.1E+03	0.0063	5.1E-02		1.4E-04	
F	Spring Creek	3.6E+05	0.0000	0.0E+00		0.0E+00	
			Total	1.0E+01		2.8E-02	

Appendix 9: Mass Flux Estimates - Metals

IRON

Average Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	1.3E+05	5.1750	6.7E+02		1.8E+00	
D	Baseline Road ditch	3.8E+04	0.5800	2.2E+01		6.0E-02	
	TOTAL				6.9E+02		1.9E+00
D	Bennett Creek	3.8E+04	0.0833	3.2E+00		8.7E-03	
C	St. Marys River	9.1E+04	0.1312	1.2E+01		3.3E-02	
A	St. Marys River	9.9E+04	5.4913	5.4E+02		1.5E+00	
E	St. Marys River	3.2E+04	0.1312	4.2E+00		1.1E-02	
	TOTAL				5.6E+02		1.5E+00
B	West Davignon Diversion	2.6E+02	31.6117	8.2E+00		2.3E-02	
F	Spring Creek	3.6E+04	0.7700	2.8E+01		7.6E-02	
			Total	1.3E+03		3.5E+00	

Minimum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	3.9E+03	5.1750	2.0E+01		5.5E-02	
D	Baseline Road ditch	9.7E+02	0.5800	5.6E-01		1.5E-03	
	TOTAL				2.1E+01		5.7E-02
D	Bennett Creek	8.2E+02	0.0833	6.8E-02		1.9E-04	
C	St. Marys River	4.9E+03	0.1312	6.4E-01		1.8E-03	
A	St. Marys River	1.3E+04	5.4913	7.3E+01		2.0E-01	
E	St. Marys River	9.7E+02	0.1312	1.3E-01		3.5E-04	
	TOTAL				7.4E+01		2.0E-01
B	West Davignon Diversion	1.4E+01	31.6117	4.4E-01		1.2E-03	
F	Spring Creek	3.5E+02	0.7700	2.7E-01		7.4E-04	
			Total	9.6E+01		2.6E-01	

Maximum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	9.5E+05	5.1750	4.9E+03		1.3E+01	
D	Baseline Road ditch	3.7E+05	0.5800	2.1E+02		5.9E-01	
	TOTAL				5.1E+03		1.4E+01
D	Bennett Creek	3.6E+05	0.0833	3.0E+01		8.2E-02	
C	St. Marys River	6.3E+05	0.1312	8.3E+01		2.3E-01	
A	St. Marys River	5.3E+05	5.4913	2.9E+03		7.9E+00	
E	St. Marys River	2.9E+05	0.1312	3.8E+01		1.0E-01	
	TOTAL				3.0E+03		8.3E+00
B	West Davignon Diversion	8.1E+03	31.6117	2.6E+02		7.1E-01	
F	Spring Creek	3.6E+05	0.7700	2.8E+02		7.6E-01	
			Total	8.7E+03		2.4E+01	

Appendix 9: Mass Flux Estimates - Metals

CHROMIUM

Average Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	1.3E+05	0.0050	6.5E-01		1.8E-03	
D	Baseline Road ditch	3.8E+04	0.0033	1.3E-01		3.5E-04	
	TOTAL				7.8E-01		2.1E-03
D	Bennett Creek	3.8E+04	0.0000	0.0E+00		0.0E+00	
C	St. Marys River	9.1E+04	0.0103	9.3E-01		2.6E-03	
A	St. Marys River	9.9E+04	0.0171	1.7E+00		4.6E-03	
E	St. Marys River	3.2E+04	0.0103	3.3E-01		9.0E-04	
	TOTAL				3.0E+00		8.1E-03
B	West Davignon Diversion	2.6E+02	0.0204	5.3E-03		1.5E-05	
F	Spring Creek	3.6E+04	0.0000	0.0E+00		0.0E+00	
			Total	3.7E+00		1.0E-02	

Minimum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	3.9E+03	0.0050	2.0E-02		5.4E-05	
D	Baseline Road ditch	9.7E+02	0.0033	3.2E-03		8.9E-06	
	TOTAL				2.3E-02		6.2E-05
D	Bennett Creek	8.2E+02	0.0000	0.0E+00		0.0E+00	
C	St. Marys River	4.9E+03	0.0103	5.0E-02		1.4E-04	
A	St. Marys River	1.3E+04	0.0171	2.3E-01		6.2E-04	
E	St. Marys River	9.7E+02	0.0103	9.9E-03		2.7E-05	
	TOTAL				2.9E-01		7.9E-04
B	West Davignon Diversion	1.4E+01	0.0204	2.9E-04		7.9E-07	
F	Spring Creek	3.5E+02	0.0000	0.0E+00		0.0E+00	
			Total	3.1E-01		8.5E-04	

Maximum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	9.5E+05	0.0050	4.8E+00		1.3E-02	
D	Baseline Road ditch	3.7E+05	0.0033	1.2E+00		3.4E-03	
	TOTAL				6.0E+00		1.6E-02
D	Bennett Creek	3.6E+05	0.0000	0.0E+00		0.0E+00	
C	St. Marys River	6.3E+05	0.0103	6.5E+00		1.8E-02	
A	St. Marys River	5.3E+05	0.0171	9.0E+00		2.5E-02	
E	St. Marys River	2.9E+05	0.0103	3.0E+00		8.2E-03	
	TOTAL				1.8E+01		5.1E-02
B	West Davignon Diversion	8.1E+03	0.0204	1.7E-01		4.6E-04	
F	Spring Creek	3.6E+05	0.0000	0.0E+00		0.0E+00	
			Total	2.5E+01		6.7E-02	

Appendix 9: Mass Flux Estimates - Metals

NICKEL

Average Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	1.3E+05	0.0000	0.0E+00		0.0E+00	
D	Baseline Road ditch	3.8E+04	0.0033	1.3E-01		3.5E-04	
	TOTAL				1.3E-01		3.5E-04
D	Bennett Creek	3.8E+04	0.0000	0.0E+00		0.0E+00	
C	St. Marys River	9.1E+04	0.0030	2.7E-01		7.5E-04	
A	St. Marys River	9.9E+04	0.0073	7.3E-01		2.0E-03	
E	St. Marys River	3.2E+04	0.0030	9.7E-02		2.6E-04	
	TOTAL				1.1E+00		3.0E-03
B	West Davignon Diversion	2.6E+02	0.0142	3.7E-03		1.0E-05	
F	Spring Creek	3.6E+04	0.0000	0.0E+00		0.0E+00	
			Total	1.2E+00		3.4E-03	

Minimum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	3.9E+03	0.0000	0.0E+00		0.0E+00	
D	Baseline Road ditch	9.7E+02	0.0033	3.2E-03		8.9E-06	
	TOTAL				3.2E-03		8.9E-06
D	Bennett Creek	8.2E+02	0.0000	0.0E+00		0.0E+00	
C	St. Marys River	4.9E+03	0.0030	1.5E-02		4.0E-05	
A	St. Marys River	1.3E+04	0.0073	9.8E-02		2.7E-04	
E	St. Marys River	9.7E+02	0.0030	2.9E-03		8.0E-06	
	TOTAL				1.2E-01		3.2E-04
B	West Davignon Diversion	1.4E+01	0.0142	2.0E-04		5.5E-07	
F	Spring Creek	3.5E+02	0.0000	0.0E+00		0.0E+00	
			Total	1.2E-01		3.3E-04	

Maximum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	9.5E+05	0.0000	0.0E+00		0.0E+00	
D	Baseline Road ditch	3.7E+05	0.0033	1.2E+00		3.4E-03	
	TOTAL				1.2E+00		3.4E-03
D	Bennett Creek	3.6E+05	0.0000	0.0E+00		0.0E+00	
C	St. Marys River	6.3E+05	0.0030	1.9E+00		5.2E-03	
A	St. Marys River	5.3E+05	0.0073	3.9E+00		1.1E-02	
E	St. Marys River	2.9E+05	0.0030	8.8E-01		2.4E-03	
	TOTAL				6.6E+00		1.8E-02
B	West Davignon Diversion	8.1E+03	0.0142	1.2E-01		3.2E-04	
F	Spring Creek	3.6E+05	0.0000	0.0E+00		0.0E+00	
		0.0000					

Appendix 9: Mass Flux Estimates - Metals

MOLYBDENUM

Average Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	1.3E+05	0.0050	6.5E-01		1.8E-03	
D	Baseline Road ditch	3.8E+04	0.0200	7.6E-01		2.1E-03	
	TOTAL				1.4E+00		3.9E-03
D	Bennett Creek	3.8E+04	0.0013	4.8E-02		1.3E-04	
C	St. Marys River	9.1E+04	0.0150	1.4E+00		3.7E-03	
A	St. Marys River	9.9E+04	0.0310	3.1E+00		8.4E-03	
E	St. Marys River	3.2E+04	0.0150	4.8E-01		1.3E-03	
	TOTAL				5.0E+00		1.3E-02
B	West Davignon Diversion	2.6E+02	0.0263	6.8E-03		1.9E-05	
F	Spring Creek	3.6E+04	0.0000	0.0E+00		0.0E+00	
			Total	6.4E+00		1.7E-02	

Minimum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	3.9E+03	0.0050	2.0E-02		5.4E-05	
D	Baseline Road ditch	9.7E+02	0.0200	1.9E-02		5.3E-05	
	TOTAL				3.9E-02		1.1E-04
D	Bennett Creek	8.2E+02	0.0013	1.0E-03		2.8E-06	
C	St. Marys River	4.9E+03	0.0150	7.3E-02		2.0E-04	
A	St. Marys River	1.3E+04	0.0310	4.1E-01		1.1E-03	
E	St. Marys River	9.7E+02	0.0150	1.4E-02		4.0E-05	
	TOTAL				5.0E-01		1.4E-03
B	West Davignon Diversion	1.4E+01	0.0263	3.7E-04		1.0E-06	
F	Spring Creek	3.5E+02	0.0000	0.0E+00		0.0E+00	
			Total	5.4E-01		1.5E-03	

Maximum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	9.5E+05	0.0050	4.8E+00		1.3E-02	
D	Baseline Road ditch	3.7E+05	0.0200	7.4E+00		2.0E-02	
	TOTAL				1.2E+01		3.3E-02
D	Bennett Creek	3.6E+05	0.0013	4.5E-01		1.2E-03	
C	St. Marys River	6.3E+05	0.0150	9.4E+00		2.6E-02	
A	St. Marys River	5.3E+05	0.0310	1.6E+01		4.5E-02	
E	St. Marys River	2.9E+05	0.0150	4.3E+00		1.2E-02	
	TOTAL				3.1E+01		8.3E-02
B	West Davignon Diversion	8.1E+03	0.0263	2.1E-01		5.9E-04	
F	Spring Creek	3.6E+05	0.0000	0.0E+00		0.0E+00	
			Total	4.3E+01		1.2E-01	

Appendix 9: Mass Flux Estimates - Metals

CALCIUM

Average Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	1.3E+05	30.8500	4.0E+03		1.1E+01	
D	Baseline Road ditch	3.8E+04	101.2500	3.8E+03		1.1E+01	
	TOTAL				7.9E+03		2.2E+01
D	Bennett Creek						
C	St. Marys River	3.8E+04	45.2667	1.7E+03		4.7E+00	
A	St. Marys River	9.1E+04	214.8408	2.0E+04		5.4E+01	
E	St. Marys River	9.9E+04	304.8500	3.0E+04		8.3E+01	
	TOTAL	3.2E+04	214.8408	6.9E+03		1.9E+01	
B	West Davignon Diversion				5.8E+04		1.6E+02
F	Spring Creek	2.6E+02	370.0000	9.6E+01		2.6E-01	
		3.6E+04	37.7500	1.4E+03		3.7E+00	
			Total	6.8E+04		1.9E+02	

Minimum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	3.9E+03	30.8500	1.2E+02		3.3E-01	
D	Baseline Road ditch	9.7E+02	101.2500	9.8E+01		2.7E-01	
	TOTAL				2.2E+02		6.0E-01
D	Bennett Creek						
C	St. Marys River	8.2E+02	45.2667	3.7E+01		1.0E-01	
A	St. Marys River	4.9E+03	214.8408	1.0E+03		2.9E+00	
E	St. Marys River	1.3E+04	304.8500	4.1E+03		1.1E+01	
	TOTAL	9.7E+02	214.8408	2.1E+02		5.7E-01	
B	West Davignon Diversion				5.4E+03		1.5E+01
F	Spring Creek	1.4E+01	370.0000	5.2E+00		1.4E-02	
		3.5E+02	37.7500	1.3E+01		3.6E-02	
			Total	5.6E+03		1.5E+01	

Maximum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	9.5E+05	30.8500	2.9E+04		8.0E+01	
D	Baseline Road ditch	3.7E+05	101.2500	3.7E+04		1.0E+02	
	TOTAL				6.7E+04		1.8E+02
D	Bennett Creek						
C	St. Marys River	3.6E+05	45.2667	1.6E+04		4.5E+01	
A	St. Marys River	6.3E+05	214.8408	1.4E+05		3.7E+02	
E	St. Marys River	5.3E+05	304.8500	1.6E+05		4.4E+02	
	TOTAL	2.9E+05	214.8408	6.2E+04		1.7E+02	
B	West Davignon Diversion				3.7E+05		9.8E+02
F	Spring Creek	8.1E+03	370.0000	3.0E+03		8.3E+00	
		3.6E+05	37.7500	1.4E+04		3.7E+01	
			Total	4.6E+05		1.3E+03	

Appendix 9: Mass Flux Estimates - Metals

VANADIUM

Average Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	1.3E+05	0.0000	0.0E+00		0.0E+00	
D	Baseline Road ditch	3.8E+04	0.0233	8.9E-01		2.4E-03	
	TOTAL				8.9E-01		2.4E-03
D	Bennett Creek						
C	St. Marys River	3.8E+04	0.0075	2.9E-01		7.8E-04	
A	St. Marys River	9.1E+04	0.0222	2.0E+00		5.5E-03	
E	St. Marys River	9.9E+04	0.0444	4.4E+00		1.2E-02	
	TOTAL	3.2E+04	0.0222	7.1E-01		1.9E-03	
B	West Davignon Diversion				7.4E+00		2.0E-02
F	Spring Creek	2.6E+02	0.0388	1.0E-02		2.8E-05	
		3.6E+04	0.0000	0.0E+00		0.0E+00	
			Total	8.3E+00		2.3E-02	

Minimum Flux

Element No.	Discharge to	*Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	3.9E+03	0.0000	0.0E+00		0.0E+00	
D	Baseline Road ditch	9.7E+02	0.0233	2.3E-02		6.2E-05	
	TOTAL				2.3E-02		6.2E-05
D	Bennett Creek						
C	St. Marys River	8.2E+02	0.0075	6.1E-03		1.7E-05	
A	St. Marys River	4.9E+03	0.0222	1.1E-01		3.0E-04	
E	St. Marys River	1.3E+04	0.0444	5.9E-01		1.6E-03	
	TOTAL	9.7E+02	0.0222	2.1E-02		5.9E-05	
B	West Davignon Diversion				7.3E-01		2.0E-03
F	Spring Creek	1.4E+01	0.0388	5.4E-04		1.5E-06	
		3.5E+02	0.0000	0.0E+00		0.0E+00	
			Total	7.5E-01		2.1E-03	

Maximum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	9.5E+05	0.0000	0.0E+00		0.0E+00	
D	Baseline Road ditch	3.7E+05	0.0233	1.5E+01		4.0E-02	
	TOTAL				1.5E+01		4.0E-02
D	Bennett Creek						
C	St. Marys River	3.6E+05	0.0075	2.2E+00		6.0E-03	
A	St. Marys River	6.3E+05	0.0222	0.0E+00		0.0E+00	
E	St. Marys River	5.3E+05	0.0444	3.6E-01		9.9E-04	
	TOTAL	2.9E+05	0.0222	8.0E+00		2.2E-02	
B	West Davignon Diversion				1.1E+01		2.3E-02
F	Spring Creek	8.1E+03	0.0388	ERR		ERR	
		3.6E+05	0.0000	ERR		ERR	
			Total	ERR		ERR	

Appendix 9: Mass Flux Estimates - Metals

ALUMINUM

Average Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	1.3E+05	0.0600	7.8E+00		2.1E-02	
D	Baseline Road ditch	3.8E+04	0.5600	2.1E+01		5.8E-02	
	TOTAL				2.9E+01		8.0E-02
D	Bennett Creek	3.8E+04	0.2000	7.6E+00		2.1E-02	
C	St. Marys River	9.1E+04	0.3897	3.5E+01		9.7E-02	
A	St. Marys River	9.9E+04	0.4078	4.0E+01		1.1E-01	
E	St. Marys River	3.2E+04	0.3897	1.2E+01		3.4E-02	
	TOTAL				9.6E+01		2.4E-01
B	West Davignon Diversion	2.6E+02	0.3900	1.0E-01		2.8E-04	
F	Spring Creek	3.6E+04	0.1400	5.0E+00		1.4E-02	
			Total	1.3E+02		3.6E-01	

Minimum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	3.9E+03	0.0600	2.3E-01		6.4E-04	
D	Baseline Road ditch	9.7E+02	0.5600	5.4E-01		1.5E-03	
	TOTAL				7.8E-01		2.1E-03
D	Bennett Creek	8.2E+02	0.2000	1.6E-01		4.5E-04	
C	St. Marys River	4.9E+03	0.3897	1.9E+00		5.2E-03	
A	St. Marys River	1.3E+04	0.4078	5.4E+00		1.5E-02	
E	St. Marys River	9.7E+02	0.3897	3.8E-01		1.0E-03	
	TOTAL				7.9E+00		2.1E-02
B	West Davignon Diversion	1.4E+01	0.3900	5.5E-03		1.5E-05	
F	Spring Creek	4.5E+02	0.1400	4.9E-02		1.3E-04	
			Total	8.7E+00		2.4E-02	

Maximum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	9.5E+05	0.0600	5.7E+01		1.6E-01	
D	Baseline Road ditch	3.7E+05	0.5600	2.1E+02		5.7E-01	
	TOTAL				2.6E+02		7.2E-01
D	Bennett Creek	3.6E+05	0.2000	7.2E+01		2.0E-01	
C	St. Marys River	6.3E+05	0.3897	2.5E+02		6.7E-01	
A	St. Marys River	5.3E+05	0.4078	2.2E+02		5.9E-01	
E	St. Marys River	2.9E+05	0.3897	1.1E+02		3.1E-01	
	TOTAL				6.5E+02		1.6E+00
B	West Davignon Diversion	8.1E+03	0.3900	3.2E+00		8.7E-03	
F	Spring Creek	3.6E+05	0.1400	5.0E+01		1.4E-01	
			Total	9.6E+02		2.6E+00	

Appendix 9: Mass Flux Estimates - Metals

MAGNESIUM

Average Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	1.3E+05	6.9250	9.0E+02		2.5E+00	
D	Baseline Road ditch	3.8E+04	2.0500	7.8E+01		2.1E-01	
	TOTAL				9.8E+02		2.7E+00
D	Bennett Creek	3.8E+04	7.1042	2.7E+02		7.4E-01	
C	St. Marys River	9.1E+04	2.5356	2.3E+02		6.3E-01	
A	St. Marys River	9.9E+04	5.8771	5.8E+02		1.6E+00	
E	St. Marys River	3.2E+04	2.5356	8.1E+01		2.2E-01	
	TOTAL				1.2E+03		2.4E+00
B	West Davignon Diversion	2.6E+02	93.2500	2.4E+01		6.6E-02	
F	Spring Creek	3.6E+04	1.8125	6.5E+01		1.8E-01	
			Total	2.2E+03		6.1E+00	

Minimum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	3.9E+03	6.9250	2.7E+01		7.4E-02	
D	Baseline Road ditch	9.7E+02	2.0500	2.0E+00		5.5E-03	
	TOTAL				2.9E+01		8.0E-02
D	Bennett Creek	8.2E+02	7.1042	5.8E+00		1.6E-02	
C	St. Marys River	4.9E+03	2.5356	1.2E+01		3.4E-02	
A	St. Marys River	1.3E+04	5.8771	7.8E+01		2.1E-01	
E	St. Marys River	9.7E+02	2.5356	2.4E+00		6.7E-03	
	TOTAL				9.9E+01		2.6E-01
B	West Davignon Diversion	1.4E+01	93.2500	1.3E+00		3.6E-03	
F	Spring Creek	3.5E+02	1.8125	6.3E-01		1.7E-03	
			Total	1.3E+02		3.6E-01	

Maximum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	9.5E+05	6.9250	6.6E+03		1.8E+01	
D	Baseline Road ditch	3.7E+05	2.0500	7.6E+02		2.1E+00	
	TOTAL				7.3E+03		2.0E+01
D	Bennett Creek	3.6E+05	7.1042	2.6E+03		7.0E+00	
C	St. Marys River	6.3E+05	2.5356	1.6E+03		4.4E+00	
A	St. Marys River	5.3E+05	5.8771	3.1E+03		8.5E+00	
E	St. Marys River	2.9E+05	2.5356	7.4E+02		2.0E+00	
	TOTAL				8.0E+03		1.5E+01
B	West Davignon Diversion	8.1E+03	93.2500	7.6E+02		2.1E+00	
F	Spring Creek	3.6E+05	1.8125	6.5E+02		1.8E+00	
			Total	1.7E+04		4.6E+01	

Appendix 9: Mass Flux Estimates - Metals

BARIUM

Average Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	1.3E+05	0.0150	2.0E+00		5.3E-03	
D	Baseline Road ditch	3.8E+04	0.0467	1.8E+00		4.9E-03	
	TOTAL				3.7E+00		1.0E-02
D	Bennett Creek	3.8E+04	0.0338	1.3E+00		3.5E-03	
C	St. Marys River	9.1E+04	0.2476	2.3E+01		6.2E-02	
A	St. Marys River	9.9E+04	0.0915	9.1E+00		2.5E-02	
E	St. Marys River	3.2E+04	0.2476	7.9E+00		2.2E-02	
	TOTAL				4.1E+01		1.1E-01
B	West Davignon Diversion	2.6E+02	0.0813	2.1E-02		5.8E-05	
F	Spring Creek	3.6E+04	0.0500	1.8E+00		4.9E-03	
			Total	4.6E+01		1.3E-01	

Minimum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	3.9E+03	0.0150	5.9E-02		1.6E-04	
D	Baseline Road ditch	9.7E+02	0.0467	4.5E-02		1.2E-04	
	TOTAL				1.0E-01		2.8E-04
D	Bennett Creek	8.2E+02	0.0338	2.8E-02		7.6E-05	
C	St. Marys River	4.9E+03	0.2476	1.2E+00		3.3E-03	
A	St. Marys River	1.3E+04	0.0915	1.2E+00		3.3E-03	
E	St. Marys River	9.7E+02	0.2476	2.4E 01		6.6E-04	
	TOTAL				2.7E+00		7.3E-03
B	West Davignon Diversion	1.4E+01	0.0813	1.1E-03		3.1E-06	
F	Spring Creek	3.5E+02	0.0500	1.8E-02		4.8E-05	
			Total	2.8E+00		7.7E-03	

Maximum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	9.5E+05	0.0150	1.4E+01		3.9E-02	
D	Baseline Road ditch	3.7E+05	0.0467	1.7E+01		4.7E-02	
	TOTAL				3.2E+01		8.6E-02
D	Bennett Creek	3.6E+05	0.0338	1.2E+01		3.3E-02	
C	St. Marys River	6.3E+05	0.2476	1.6E+02		4.3E-01	
A	St. Marys River	5.3E+05	0.0915	4.8E+01		1.3E-01	
E	St. Marys River	2.9E+05	0.2476	7.2E+01		2.0E-01	
	TOTAL				2.9E+02		7.6E-01
B	West Davignon Diversion	8.1E+03	0.0813	6.6E-01		1.8E-03	
F	Spring Creek	3.6E+05	0.0500	1.8E+01		4.9E-02	
			Total	3.4E+02		9.3E-01	

Appendix 9: Mass Flux Estimates - Metals

POTASSIUM

Average Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	1.3E+05	3.5500	4.6E+02		1.3E+00	
D	Baseline Road ditch	3.8E+04	9.7000	3.7E+02		1.0E+00	
	TOTAL				8.3E+02		2.3E+00
D	Bennett Creek	3.8E+04	1.8000	6.8E+01		1.9E-01	
C	St. Marys River	9.1E+04	49.1350	4.5E+03		1.2E+01	
A	St. Marys River	9.9E+04	197.6417	2.0E+04		5.4E+01	
E	St. Marys River	3.2E+04	49.1350	1.6E+03		4.3E+00	
	TOTAL				2.6E+04		7.0E+01
B	West Davignon Diversion	2.6E+02	207.0000	5.4E+01		1.5E-01	
F	Spring Creek	3.6E+04	5.4250	2.0E+02		5.4E-01	
			Total	2.7E+04		7.3E+01	

Minimum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	3.9E+03	3.5500	1.4E+01		3.8E-02	
D	Baseline Road ditch	9.7E+02	9.7000	9.4E+00		2.6E-02	
	TOTAL				2.3E+01		6.4E-02
D	Bennett Creek	8.2E+02	1.8000	1.5E+00		4.0E-03	
C	St. Marys River	4.9E+03	49.1350	2.4E+02		6.6E-01	
A	St. Marys River	1.3E+04	197.6417	2.6E+03		7.2E+00	
E	St. Marys River	9.7E+02	49.1350	4.7E+01		1.3E-01	
	TOTAL				2.9E+03		8.0E+00
B	West Davignon Diversion	1.4E+01	207.0000	2.9E+00		8.0E-03	
F	Spring Creek	3.5E+02	5.4250	1.9E+00		5.2E-03	
			Total	3.0E+03		8.1E+00	

Maximum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	9.5E+05	3.5500	3.4E+03		9.2E+00	
D	Baseline Road ditch	3.7E+05	9.7000	3.6E+03		9.8E+00	
	TOTAL				7.0E+03		1.9E+01
D	Bennett Creek	3.6E+05	1.8000	6.5E+02		1.8E+00	
C	St. Marys River	6.3E+05	49.1350	3.1E+04		8.5E+01	
A	St. Marys River	5.3E+05	197.6417	1.0E+05		2.9E+02	
E	St. Marys River	2.9E+05	49.1350	1.4E+04		3.9E+01	
	TOTAL				1.5E+05		4.1E+02
B	West Davignon Diversion	8.1E+03	207.0000	1.7E+03		4.6E+00	
F	Spring Creek	3.6E+05	5.4250	2.0E+03		5.4E+00	
			Total	1.6E+05		4.4E+02	

Appendix 9: Mass Flux Estimates - Metals

STRONTIUM

Average Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	1.3E+05	0.2250	2.9E+01		8.0E-02	
D	Baseline Road ditch	3.8E+04	0.3200	1.2E+01		3.3E-02	
	TOTAL				4.1E+01		1.1E-01
D	Bennett Creek	3.8E+04	0.1725	6.6E+00		1.8E-02	
C	St. Marys River	9.1E+04	0.8341	7.6E+01		2.1E-01	
A	St. Marys River	9.9E+04	1.1988	1.2E+02		3.3E-01	
E	St. Marys River	3.2E+04	0.8341	2.7E+01		7.3E-02	
	TOTAL				2.3E+02		6.1E-01
B	West Davignon Diversion	2.6E+02	1.3288	3.5E-01		9.5E-04	
F	Spring Creek	3.6E+04	0.0800	2.9E+00		7.9E-03	
			Total	2.7E+02		7.5E-01	

Minimum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	3.9E+03	0.2250	8.8E-01		2.4E-03	
D	Baseline Road ditch	9.7E+02	0.3200	3.1E-01		8.5E-04	
	TOTAL				1.2E+00		3.3E-03
D	Bennett Creek	8.2E+02	0.1725	1.4E-01		3.9E-04	
C	St. Marys River	4.9E+03	0.8341	4.1E+00		1.1E-02	
A	St. Marys River	1.3E+04	1.1988	1.6E+01		4.4E-02	
E	St. Marys River	9.7E+02	0.8341	8.1E-01		2.2E-03	
	TOTAL				2.1E+01		5.7E-02
B	West Davignon Diversion	1.4E+01	1.3288	1.9E-02		5.1E-05	
F	Spring Creek	3.5E+02	0.0800	2.8E-02		7.7E-05	
			Total	2.2E+01		6.1E-02	

Maximum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	9.5E+05	0.2250	2.1E+02		5.9E-01	
D	Baseline Road ditch	3.7E+05	0.3200	1.2E+02		3.2E-01	
	TOTAL				3.3E+02		9.1E-01
D	Bennett Creek	3.6E+05	0.1725	6.2E+01		1.7E-01	
C	St. Marys River	6.3E+05	0.8341	5.3E+02		1.4E+00	
A	St. Marys River	5.3E+05	1.1988	6.3E+02		1.7E+00	
E	St. Marys River	2.9E+05	0.8341	2.4E+02		6.6E-01	
	TOTAL				1.5E+03		3.8E+00
B	West Davignon Diversion	8.1E+03	1.3288	1.1E+01		3.0E-02	
F	Spring Creek	3.6E+05	0.0800	2.9E+01		7.9E-02	
			Total	1.8E+03		5.0E+00	

Appendix 9: Mass Flux Estimates - Metals

SODIUM

Average Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	1.3E+05	18.2500	2.4E+03		6.5E+00	
D	Baseline Road ditch	3.8E+04	61.2500	2.3E+03		6.4E+00	
	TOTAL				4.7E+03		1.3E+01
D	Bennett Creek	3.8E+04	12.1250	4.6E+02		1.3E+00	
C	St. Marys River	9.1E+04	43.4521	4.0E+03		1.1E+01	
A	St. Marys River	9.9E+04	71.7000	7.1E+03		1.9E+01	
E	St. Marys River	3.2E+04	43.4521	1.4E+03		3.8E+00	
	TOTAL				1.3E+04		3.4E+01
B	West Davignon Diversion	2.6E+02	153.5000	4.0E+01		1.1E-01	
F	Spring Creek	3.6E+04	14.8750	5.4E+02		1.5E+00	
			Total	1.8E+04		5.0E+01	

Minimum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	3.9E+03	18.2500	7.1E+01		2.0E-01	
D	Baseline Road ditch	9.7E+02	61.2500	5.9E+01		1.6E-01	
	TOTAL				1.3E+02		3.6E-01
D	Bennett Creek	8.2E+02	12.1250	9.9E+00		2.7E-02	
C	St. Marys River	4.9E+03	43.4521	2.1E+02		5.8E-01	
A	St. Marys River	1.3E+04	71.7000	9.6E+02		2.6E+00	
E	St. Marys River	9.7E+02	43.4521	4.2E+01		1.1E-01	
	TOTAL				1.2E+03		3.3E+00
B	West Davignon Diversion	1.4E+01	153.5000	2.2E+00		5.9E-03	
F	Spring Creek	3.5E+02	14.8750	5.2E+00		1.4E-02	
			Total	1.4E+03		3.7E+00	

Maximum Flux

Element No.	Discharge to	Flux,q (M3/yr)	Weighted Avg. conc.	Mass Flux (Kg/yr)		Mass Flux (kg/day)	
C	Baseline Road ditch	9.5E+05	18.2500	1.7E+04		4.8E+01	
D	Baseline Road ditch	3.7E+05	61.2500	2.3E+04		6.2E+01	
	TOTAL				4.0E+04		1.1E+02
D	Bennett Creek	3.6E+05	12.1250	4.4E+03		1.2E+01	
C	St. Marys River	6.3E+05	43.4521	2.7E+04		7.5E+01	
A	St. Marys River	5.3E+05	71.7000	3.8E+04		1.0E+02	
E	St. Marys River	2.9E+05	43.4521	1.3E+04		3.5E+01	
	TOTAL				8.2E+04		2.1E+02
B	West Davignon Diversion	8.1E+03	153.5000	1.3E+03		3.4E+00	
F	Spring Creek	3.6E+05	14.8750	5.4E+03		1.5E+01	
		0.0000	Total	1.3E+05		3.5E+02	

APPENDIX 10

SURFACE WATER FLOW DATA

TOTAL DAILY DISCHARGE - STATION SW1

Day	Aug	Sept	1988 Oct	Nov	Dec	1989 Jan	Feb	Mar	1989 Apr	May	June	July	Day
1	0.002	0.055	0.379	1.417	0.854	0.132	0.062	0.039	5.58	0.736	0.129	0.0078	1
2	0.003	0.037	1.308	1.374	0.651	0.128	0.060	0.038	5.3	0.556	0.126	0.0064	2
3	0.004	0.028	1.038	1.053	0.532	0.126	0.059	0.038	5.2	0.422	0.110	0.0055	3
4	0.003	0.050	0.993	1.046	0.417	0.125	0.057	0.037	5.02	0.327	0.080	0.0049	4
5	0.005	0.042	0.750	9.77	0.337	0.121	0.056	0.036	4.96	0.302	0.061	0.0043	5
6	0.006	0.039	0.434	13.3	0.291	0.119	0.054	0.035	4.83	0.298	0.052	0.0039	6
7	0.005	0.027	0.293	4.64	0.236	0.120	0.053	0.034	4.65	0.236	0.045	0.0036	7
8	0.005	0.021	0.238	1.882	0.199	0.120	0.051	0.034	4.33	0.195	0.052	0.0033	8
9	0.004	0.019	0.191	1.259	0.184	0.115	0.050	0.034	2.526	0.157	0.128	0.0030	9
10	0.003	0.015	0.526	1.349	0.172	0.112	0.049	0.033	1.780	0.133	0.102	0.0026	10
11	0.002	0.010	0.833	1.581	0.172	0.107	0.048	0.033	1.226	0.113	0.068	0.0023	11
12	0.002	0.011	0.638	1.061	0.172	0.104	0.046	0.032	0.948	0.094	0.048	0.0021	12
13	0.007	0.026	0.508	1.698	0.172	0.100	0.046	0.031	1.316	0.086	0.044	0.0017	13
14	0.178	0.020	0.434	1.798	0.158	0.097	0.044	0.031	1.608	0.080	0.040	0.0014	14
15	0.185	0.015	0.363	1.564	0.156	0.093	0.044	0.031	2.464	0.073	0.064	0.0012	15
16	0.084	0.012	0.368	2.341	0.140	0.091	0.043	0.030	4.22	0.065	0.109	0.0012	16
17	0.363	0.011	1.146	2.201	0.128	0.086	0.042	0.030	5.49	0.057	0.146	0.0012	17
18	0.249	0.013	1.494	1.383	0.119	0.085	0.041	0.029	4.73	0.050	0.134	0.0012	18
19	0.082	0.022	1.139	0.970	0.130	0.081	0.041	0.029	2.977	0.049	0.082	0.0012	19
20	0.039	0.353	0.812	1.267	0.148	0.080	0.039	0.028	2.792	0.075	0.054	0.0010	20
21	0.022	0.347	0.651	1.194	0.133	0.079	0.039	0.028	2.879	0.379	0.039	0.0008	21
22	0.013	0.183	0.619	0.883	0.148	0.077	0.039	0.028	2.922	0.272	0.032	0.0008	22
23	0.010	0.171	0.550	0.703	0.162	0.075	0.039	0.028	2.464	0.158	0.035	0.0007	23
24	0.016	0.114	1.038	0.593	0.164	0.073	0.039	0.029	2.211	0.106	0.037	0.0007	24
25	0.082	0.068	2.025	0.520	0.159	0.070	0.039	0.029	2.759	0.313	0.027	0.0007	25
26	0.150	0.085	2.824	0.763	0.156	0.069	0.039	0.031	4.59	0.283	0.021	0.0008	26
27	0.142	0.266	2.083	8.67	0.151	0.068	0.039	0.038	2.879	0.167	0.019	0.0010	27
28	1.537	0.169	2.392	5.91	0.146	0.067	0.039	0.241	1.958	0.116	0.021	0.0010	28
29	0.514	0.097	1.817	2.034	0.143	0.066		2.792	1.178	0.090	0.012	0.0008	29
30	0.180	0.077	1.186	1.300	0.137	0.065		7.2	0.890	0.070	0.010	0.0007	30
31	0.095		0.911		0.133	0.065		6.3		0.106		0.0007	31
TOTAL	3.995	2.403	29.979	75.524	7.001	2.917	1.298	17.407	96.677	6.164	1.928	0.068	TOTAL
MEAN	0.129	0.080	0.967	2.517	0.226	0.094	0.046	0.562	3.223	0.199	0.064	0.002	MEAN
ST.D.	0.283	0.095	0.655	2.964	0.166	0.012	0.007	1.700	1.509	0.159	0.040	0.002	ST.D.
MAX	1.537	0.353	2.824	13.300	0.854	0.132	0.062	7.200	5.580	0.736	0.146	0.008	MAX
MIN	0.002	0.010	0.191	0.520	0.119	0.065	0.039	0.028	0.890	0.049	0.010	0.001	MIN

NOTE: all values in m^3/s

TOTAL DAILY DISCHARGE - STATION SW2

Day	Aug	Sept	1988 Oct	Nov	Dec	1989 Jan	Feb	Mar	1989 Apr	May	June	July	Day
1	0.002	0.055	0.379	1.417	0.854	0.132	0.062	0.039	5.58	0.736	0.129	0.0078	1
2	0.003	0.037	1.308	1.374	0.651	0.128	0.060	0.038	5.3	0.556	0.126	0.0064	2
3	0.004	0.028	1.038	1.053	0.532	0.126	0.059	0.038	5.2	0.422	0.110	0.0055	3
4	0.003	0.050	0.993	1.046	0.417	0.125	0.057	0.037	5.02	0.327	0.080	0.0049	4
5	0.005	0.042	0.750	9.77	0.337	0.121	0.056	0.036	4.96	0.302	0.061	0.0043	5
6	0.006	0.039	0.434	13.3	0.291	0.119	0.054	0.035	4.83	0.298	0.052	0.0039	6
7	0.005	0.027	0.293	4.64	0.236	0.120	0.053	0.034	4.65	0.236	0.045	0.0036	7
8	0.005	0.021	0.238	1.882	0.199	0.120	0.051	0.034	4.33	0.195	0.052	0.0033	8
9	0.004	0.019	0.191	1.259	0.184	0.115	0.050	0.034	2.526	0.157	0.128	0.0030	9
10	0.003	0.015	0.526	1.349	0.172	0.112	0.049	0.033	1.780	0.133	0.102	0.0026	10
11	0.002	0.010	0.833	1.581	0.172	0.107	0.048	0.033	1.226	0.113	0.068	0.0023	11
12	0.002	0.011	0.638	1.061	0.172	0.104	0.046	0.032	0.948	0.094	0.048	0.0021	12
13	0.007	0.026	0.508	1.698	0.172	0.100	0.046	0.031	1.316	0.086	0.044	0.0017	13
14	0.178	0.020	0.434	1.798	0.158	0.097	0.044	0.031	1.608	0.080	0.040	0.0014	14
15	0.185	0.015	0.363	1.564	0.156	0.093	0.044	0.031	2.464	0.073	0.064	0.0012	15
16	0.084	0.012	0.368	2.341	0.140	0.091	0.043	0.030	4.22	0.065	0.109	0.0012	16
17	0.363	0.011	1.146	2.201	0.128	0.086	0.042	0.030	5.49	0.057	0.146	0.0012	17
18	0.249	0.013	1.494	1.383	0.119	0.085	0.041	0.029	4.73	0.050	0.134	0.0012	18
19	0.082	0.022	1.139	0.970	0.130	0.081	0.041	0.029	2.977	0.049	0.082	0.0012	19
20	0.039	0.353	0.812	1.267	0.148	0.080	0.039	0.028	2.792	0.075	0.054	0.0010	20
21	0.022	0.347	0.651	1.194	0.133	0.079	0.039	0.028	2.879	0.379	0.039	0.0008	21
22	0.013	0.183	0.619	0.883	0.148	0.077	0.039	0.028	2.922	0.272	0.032	0.0008	22
23	0.010	0.171	0.550	0.703	0.162	0.075	0.039	0.028	2.464	0.158	0.035	0.0007	23
24	0.016	0.114	1.038	0.593	0.164	0.073	0.039	0.029	2.211	0.106	0.037	0.0007	24
25	0.082	0.068	2.025	0.520	0.159	0.070	0.039	0.029	2.759	0.313	0.027	0.0007	25
26	0.150	0.085	2.824	0.763	0.156	0.069	0.039	0.031	4.59	0.283	0.021	0.0008	26
27	0.142	0.266	2.083	8.67	0.151	0.068	0.039	0.038	2.879	0.167	0.019	0.0010	27
28	1.537	0.169	2.392	5.91	0.146	0.067	0.039	0.241	1.958	0.116	0.021	0.0010	28
29	0.514	0.097	1.817	2.034	0.143	0.066		2.792	1.178	0.090	0.012	0.0008	29
30	0.180	0.077	1.186	1.300	0.137	0.065		7.2	0.890	0.070	0.010	0.0007	30
31	0.095		0.911		0.133	0.065		6.3		0.106		0.0007	31
TOTAL	3.995	2.403	29.979	75.524	7.001	2.917	1.298	17.407	96.677	6.164	1.928	0.068	TOTAL
MEAN	0.129	0.080	0.967	2.517	0.226	0.094	0.046	0.562	3.223	0.199	0.064	0.002	MEAN
ST.D.	0.283	0.095	0.655	2.964	0.166	0.022	0.007	1.700	1.509	0.159	0.040	0.002	ST.D.
MAX	1.537	0.353	2.824	13.300	0.854	0.132	0.062	7.200	5.580	0.736	0.146	0.008	MAX
MIN	0.002	0.010	0.191	0.520	0.119	0.065	0.039	0.028	0.890	0.049	0.010	0.001	MIN

NOTE: all values in m^3/s

TOTAL DAILY DISCHARGE - STATION SW3

Day	Aug	Sept	1988 Oct	Nov	Dec	1989 Jan	Feb	Mar	Apr	May	June	July	Day
1	0.043	0.164	0.360	0.616	0.501	0.234	0.172	0.142	1.001	0.472	0.232	0.074	1
2	0.051	0.139	0.596	0.608	0.449	0.231	0.170	0.142	0.969	0.421	0.230	0.069	2
3	0.056	0.124	0.543	0.546	0.413	0.230	0.169	0.141	0.958	0.376	0.217	0.064	3
4	0.053	0.158	0.533	0.544	0.374	0.229	0.166	0.140	0.937	0.339	0.191	0.061	4
5	0.061	0.148	0.475	1.425	0.343	0.226	0.165	0.138	0.930	0.328	0.171	0.058	5
6	0.068	0.143	0.380	1.730	0.323	0.225	0.163	0.137	0.914	0.326	0.160	0.056	6
7	0.063	0.123	0.324	0.891	0.297	0.226	0.161	0.135	0.893	0.297	0.152	0.054	7
8	0.059	0.111	0.298	0.691	0.277	0.226	0.159	0.135	0.853	0.275	0.160	0.052	8
9	0.059	0.107	0.272	0.587	0.268	0.222	0.158	0.134	0.779	0.251	0.231	0.050	9
10	0.053	0.096	0.411	0.604	0.261	0.219	0.156	0.134	0.676	0.235	0.211	0.047	10
11	0.045	0.080	0.496	0.644	0.261	0.215	0.155	0.132	0.581	0.220	0.179	0.045	11
12	0.045	0.086	0.445	0.547	0.261	0.212	0.153	0.131	0.523	0.204	0.155	0.043	12
13	0.073	0.121	0.406	0.663	0.261	0.209	0.152	0.131	0.598	0.197	0.150	0.040	13
14	0.264	0.108	0.380	0.679	0.252	0.207	0.150	0.130	0.648	0.192	0.144	0.037	14
15	0.269	0.096	0.354	0.641	0.251	0.204	0.149	0.129	0.772	0.184	0.175	0.035	15
16	0.195	0.087	0.356	0.756	0.240	0.202	0.148	0.128	0.840	0.175	0.217	0.035	16
17	0.354	0.086	0.565	0.737	0.232	0.197	0.147	0.128	0.991	0.167	0.244	0.035	17
18	0.304	0.091	0.629	0.610	0.225	0.196	0.146	0.127	0.902	0.158	0.236	0.034	18
19	0.193	0.112	0.563	0.528	0.233	0.192	0.145	0.126	0.833	0.156	0.193	0.034	19
20	0.143	0.350	0.491	0.588	0.245	0.191	0.143	0.125	0.812	0.186	0.163	0.032	20
21	0.113	0.347	0.449	0.574	0.235	0.190	0.143	0.125	0.822	0.360	0.143	0.030	21
22	0.091	0.268	0.439	0.508	0.246	0.188	0.143	0.125	0.827	0.315	0.131	0.029	22
23	0.082	0.260	0.419	0.463	0.255	0.186	0.143	0.125	0.772	0.252	0.137	0.028	23
24	0.100	0.221	0.543	0.432	0.256	0.184	0.143	0.126	0.738	0.214	0.140	0.028	24
25	0.193	0.179	0.712	0.410	0.253	0.181	0.143	0.127	0.808	0.333	0.123	0.027	25
26	0.247	0.196	0.816	0.479	0.251	0.180	0.143	0.129	0.885	0.319	0.110	0.029	26
27	0.241	0.312	0.721	1.321	0.248	0.179	0.143	0.142	0.822	0.258	0.106	0.032	27
28	0.637	0.259	0.762	1.038	0.244	0.178	0.143	0.299	0.703	0.222	0.111	0.031	28
29	0.408	0.206	0.681	0.714	0.242	0.177		0.812	0.571	0.200	0.089	0.029	29
30	0.266	0.188	0.573	0.595	0.238	0.176		1.176	0.510	0.181	0.080	0.028	30
31	0.205		0.515		0.235	0.176		1.081		0.214		0.028	31
TOTAL	5.033	4.967	15.507	21.169	8.669	6.286	4.273	6.933	23.866	8.028	4.982	1.274	TOTAL
MEAN	0.162	0.166	0.500	0.706	0.280	0.203	0.153	0.224	0.796	0.259	0.166	0.041	MEAN
ST.D.	0.134	0.078	0.138	0.296	0.067	0.020	0.009	0.268	0.138	0.080	0.045	0.013	ST.D.
MAX	0.637	0.350	0.816	1.730	0.501	0.234	0.172	1.176	1.001	0.472	0.244	0.074	MAX
MIN	0.043	0.080	0.272	0.410	0.225	0.176	0.143	0.125	0.510	0.156	0.080	0.027	MIN

NOTE: all values in m^3/s

TOTAL DAILY DISCHARGE - BIG CARP RIVER

Day	1988 Aug	1988 Sept	1988 Oct	1988 Nov	1988 Dec	1989 Jan	1989 Feb	1989 Mar	1989 Apr	1989 May	1989 June	1989 July	Day
1	0.038	0.316	1.1	2.58	1.86	0.555	0.34	0.252	5.58	1.69	0.547	0.089	1
2	0.049	0.243	2.45	2.53	1.56	0.545	0.334	0.25	5.3	1.41	0.541	0.079	2
3	0.058	0.203	2.11	2.13	1.37	0.54	0.33	0.249	5.2	1.18	0.494	0.071	3
4	0.053	0.298	2.05	2.12	1.17	0.536	0.323	0.245	5.02	1	0.402	0.066	4
5	0.065	0.267	1.71	9.77	1.02	0.526	0.318	0.24	4.96	0.949	0.336	0.061	5
6	0.078	0.255	1.2	13.3	0.927	0.52	0.312	0.238	4.83	0.941	0.305	0.057	6
7	0.069	0.199	0.931	4.64	0.81	0.524	0.307	0.233	4.65	0.81	0.279	0.054	7
8	0.063	0.169	0.814	3.1	0.725	0.524	0.302	0.232	4.33	0.717	0.303	0.051	8
9	0.062	0.16	0.706	2.39	0.69	0.51	0.298	0.23	3.75	0.622	0.545	0.048	9
10	0.053	0.135	1.36	2.5	0.66	0.499	0.292	0.228	2.99	0.559	0.472	0.044	10
11	0.041	0.102	1.83	2.77	0.659	0.485	0.289	0.225	2.35	0.503	0.364	0.041	11
12	0.041	0.114	1.54	2.14	0.659	0.476	0.283	0.222	1.99	0.447	0.29	0.038	12
13	0.087	0.195	1.33	2.9	0.66	0.465	0.28	0.22	2.46	0.422	0.273	0.033	13
14	0.674	0.162	1.2	3.01	0.626	0.457	0.275	0.218	2.8	0.404	0.256	0.03	14
15	0.691	0.135	1.07	2.75	0.62	0.445	0.272	0.216	3.69	0.379	0.349	0.027	15
16	0.414	0.116	1.08	3.57	0.578	0.438	0.268	0.214	4.22	0.351	0.493	0.027	16
17	1.07	0.114	2.25	3.43	0.546	0.422	0.265	0.212	5.49	0.324	0.594	0.027	17
18	0.839	0.125	2.67	2.54	0.521	0.42	0.262	0.211	4.73	0.298	0.562	0.026	18
19	0.41	0.173	2.24	2.02	0.55	0.407	0.26	0.209	4.17	0.293	0.41	0.026	19
20	0.254	1.05	1.8	2.4	0.598	0.402	0.254	0.206	4	0.387	0.312	0.024	20
21	0.174	1.04	1.56	2.31	0.56	0.399	0.253	0.205	4.08	1.1	0.253	0.021	21
22	0.125	0.687	1.51	1.9	0.6	0.392	0.253	0.205	4.12	0.888	0.221	0.02	22
23	0.105	0.658	1.4	1.64	0.636	0.386	0.255	0.205	3.69	0.624	0.236	0.019	23
24	0.144	0.507	2.11	1.47	0.64	0.378	0.255	0.208	3.44	0.483	0.245	0.019	24
25	0.408	0.364	3.25	1.35	0.627	0.37	0.255	0.21	3.97	0.972	0.201	0.018	25
26	0.605	0.418	4.03	1.73	0.62	0.365	0.255	0.217	4.59	0.91	0.168	0.02	26
27	0.582	0.876	3.31	8.67	0.607	0.362	0.255	0.25	4.08	0.647	0.159	0.024	27
28	2.72	0.652	3.62	5.91	0.595	0.36	0.255	0.82	3.18	0.511	0.17	0.023	28
29	1.34	0.455	3.03	3.26	0.585	0.356		4	2.29	0.434	0.119	0.02	29
30	0.68	0.391	2.3	2.44	0.57	0.353		7.2	1.91	0.368	0.102	0.019	30
31	0.449		1.94		0.56	0.352		6.3		0.482		0.019	31
TOTAL	12.441	10.579	59.501	103.27	23.409	13.769	7.9	24.37	117.86	21.105	10.001	1.141	TOTAL
MEAN	0.401	0.353	1.919	3.442	0.755	0.444	0.282	0.786	3.929	0.681	0.333	0.037	MEAN
ST.D.	0.540	0.270	0.839	2.617	0.315	0.068	0.028	1.708	1.033	0.343	0.140	0.020	ST.D.
MAX	2.720	1.050	4.030	13.300	1.860	0.555	0.340	7.200	5.580	1.690	0.594	0.089	MAX
MIN	0.038	0.102	0.706	1.350	0.521	0.352	0.253	0.205	1.910	0.293	0.102	0.018	MIN

NOTE: all values in m^3/s

APPENDIX 11

SURFACE WATER QUALITY DATA

SURFACE WATER SITE	SW-1	SW-1	SW-1	SW-1	SW-1	SW-1	SW-1
Sample Date (mm/dd/yy)	08/13/88	09/24/88	10/22/88	12/02/88	04/11/89	05/12/89	06/16/89
BAS Reference Number	8808067-08	8809202-01	8810139-1	8812017-01	8904077-1	8905083-1	8906104-1
Sampling Level	3	1	2	1	2	1	1
pH	7.2	7.5	7.8	7.5	6.5	6.5	7.7
Specific Conductance (uS/cm)	321	101	95	86.6	80	120	140
Temperature (C)	23.5	16	7	1	-1	11	15.5
Dissolved Oxygen	8	NA	NA	NA	16.4	12.2	8.8
Dissolved Inorganic Carbon	18	NA	NA	NA	NA	NA	NA
Alkalinity (as CaCO3)	64	NA	25	22	24	26	35
Sulphide	<0.05	NA	NA	NA	NA	NA	NA
Total Cyanide	0.004	NA	NA	NA	0.003	NA	NA
Bromide	<0.1	<0.05	<0.05	<0.05	<0.005	NA	<0.05
Chloride	18.2	7.0	8.2	6.0	9.8	NA	13.2
Fluoride	0.12	0.06	0.06	0.07	0.06	NA	0.05
Sulphate	51	22	25	36	16	NA	19
Ammonia-N	0.5	NA	NA	NA	NA	NA	NA
Nitrate-N	0.04	0.12	0.11	0.24	0.48	NA	0.14
Total Kjeldahl Nitrogen	0.71	NA	0.42/0.39	0.38	0.33/0.31	0.55	0.55
Total Phosphorus	0.006	NA	0.006	0.015	0.009	0.01	0.006
Dissolved Organic Carbon	5.5	9.5	6.5	5.5/6.0	5.8/5.8	5.7/6.1	7.5
Phenols	0.006	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
PCB's	<0.1	NA	NA	NA	NA	NA	NA
Oil and Grease	1	<1	NA	NA	NA	NA	NA
Zinc	<0.01	<0.01	NA	NA	0.02	NA	NA
Cadmium	0.0008	<0.0002	NA	NA	<0.005	NA	NA
Manganese	0.23	0.06	NA	NA	0.05	NA	NA
Cobalt	<0.01	<0.01	NA	NA	<0.01	NA	NA
Copper	<0.005	<0.005	NA	NA	<0.005	NA	NA
Iron	3.1	1.04	NA	NA	0.56	NA	NA
Lead	<0.05	<0.05	NA	NA	<0.05	NA	NA
Chromium	<0.01	<0.01	NA	NA	<0.01	NA	NA
Nickel	<0.01	<0.01	NA	NA	<0.01	NA	NA
Beryllium	<0.01	NA	NA	<0.01	<0.01	NA	NA
Molybdenum	<0.02	NA	NA	<0.02	<0.02	NA	NA
Calcium	32	NA	14.8	16.7	12	17	NA
Vanadium	<0.01	NA	NA	<0.01	<0.01	NA	NA
Aluminum	0.2	NA	NA	0.16	0.26	NA	NA
Magnesium	6.6	NA	3.3	3.1	2.8	3.6	NA
Barium	0.02	NA	NA	0.01	0.01/0.02	NA	NA
Potassium	3.9	NA	2.2	2.7	1.5	2.4	NA
Strontium	0.13	NA	NA	0.06	0.05	NA	NA
Sodium	11.0	NA	5.5	4.0	5.5	5.5	NA
Mercury (ug/L)	<0.05	NA	NA	NA	NA	NA	NA
Arsenic (ug/L)	<0.1	NA	NA	NA	NA	NA	NA
Selenium (ug/L)	<0.1	NA	NA	NA	NA	NA	NA

NOTE: All Units are in (mg/L) unless otherwise specified
NA Not Analyzed

SURFACE WATER SITE	SW-1	SW-1	SW-1	SW-1	SW-1	SW-1	SW-1
Sample Date (mm/dd/yy)	08/13/88	09/24/88	10/22/88	12/02/88	04/11/89	05/12/89	06/16/89
BAS Reference Number	8808067-08	8809202-01	8810139-1	8812017-01	8904077-1	8905083-1	8906104-1
Sampling Level	3	1	2	1	2		
PAHs (ug/L)							
Naphthalene	0.02	NA	0.1	NA	<0.1	NA	NA
Acenaphthalene	<0.01	NA	<0.1	NA	<0.1	NA	NA
Acenaphthene	<0.01	NA	<0.1	NA	<0.1	NA	NA
Fluorene	<0.01	NA	<0.1	NA	<0.1	NA	NA
Phenanthrene	0.05	NA	<0.1	NA	<0.1	NA	NA
Anthracene	<0.01	NA	<0.1	NA	<0.1	NA	NA
Fluoranthene	<0.01	NA	<0.1	NA	<0.1	NA	NA
Pyrene	<0.01	NA	<0.1	NA	<0.1	NA	NA
Benzo(a)anthracene	<0.02	NA	<0.1	NA	<0.1	NA	NA
Chrysene	<0.02	NA	<0.1	NA	<0.1	NA	NA
Benzo(b)fluoranthene	<0.05	NA	<0.1	NA	<0.1	NA	NA
Benzo(k)fluoranthene	<0.05	NA	*	NA	<0.1	NA	NA
Benzo(a)pyrene	<0.05	NA	<0.1	NA	<0.1	NA	NA
Perylene	<0.05	NA	<0.1	NA	<0.1	NA	NA
Indelol(1,2,3-c,d)pyrene	<0.1	NA	<0.1	NA	<0.1	NA	NA
Dibenzo(a,h)anthracene	<0.2	NA	<0.1	NA	<0.5	NA	NA
Benzo(g,h,i)perylene	<0.1	NA	<0.1	NA	<0.5	NA	NA
Total PAHs**	0.07	NA	0.01	NA	ND	NA	NA
Benzene	NA	NA	<2	NA	NA	NA	NA
Toluene	NA	NA	<1	NA	NA	NA	NA
Xylenes	NA	NA	<1	NA	NA	NA	NA
Total BTX**	NA	NA	NA	NA	NA	NA	NA

* The result for Benzo (b) fluorcenthene includes the combined concentration of both Benzo (b) plus Benzo (k) fluorcenthene.
** Positive values only

SURFACE WATER SITE	SW-2	SW-2	SW-2	SW-2	SW-2	SW-2 Trip Blank	SW-2	SW-2
Sample Date (mm/dd/yy)	08/13/88	09/24/88	10/22/88	12/02/88	04/11/89	04/11/89	05/12/89	06/16/89
BAS Reference Number	8808067-06	8809202-02	8810139-02	8812017-02	8904077-02	8904077-03	8905083	8906104
Sampling Level	2	1	2	1	2	2	1	1
pH	7.7	8	7.9	7.9	7.2		6.75	7.9
Specific Conductance (uS/cm)	171	67	71	44.8	55		65	NA
Temperature (C)	21.5	15	7	1.5	1		9	15.5
Dissolved Oxygen	8.4	NA	NA	NA	14.8		11	NA
Dissolved Inorganic Carbon	14	NA	NA	NA	NA	NA	NA	NA
Alkalinity (as CaCO3)	52	NA	20	16	19	2	17	28
Sulphide	<0.05	NA	NA	NA	NA	NA	NA	NA
Total Cyanide	NA	NA	NA	NA	<0.002	<0.002	NA	NA
Bromide	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.05
Chloride	13.8	5/5	5.5	4.5	7.3	0.02	NA	10.7/10.6
Fluoride	0.08	0.05	0.003	0.04	0.02	<0.01	NA	0.06/0.06
Sulphate	8.8	9.0/8.9	11.2	10.6	9.0	<0.05	NA	5.7/5.6
Ammonia-N	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate-N	0.12	0.07/0.07	0.09	0.21	0.46	<0.01	NA	0.14/0.14
Total Kjeldahl Nitrogen	0.26	NA	0.3	0.28	0.29	0.04	0.26	0.37
Total Phosphorus	NA	NA	0.004	0.01	0.016	<0.001	0.009	0.009
Dissolved Organic Carbon	5	9	7.0/7.0	5.5	5.8	<0.5	5.2	7.5
Phenols	<0.001	<0.001	<0.001	<0.001	0.003	0.005	<0.001	<0.001
PCB's	NA	NA	NA	NA	NA	NA	NA	NA
Oil and Grease	NA	2	NA	NA	NA	NA	NA	NA
Zinc	0.02	0.01	NA	NA	0.01	<0.01	NA	NA
Cadmium	0.0006	<0.0002	NA	NA	<0.005	<0.005	NA	NA
Manganese	0.08	0.03	NA	NA	0.04	<0.01	NA	NA
Cobalt	<0.01	<0.01	NA	NA	<0.01	<0.01	NA	NA
Copper	<0.005	<0.005	NA	NA	<0.005	<0.005	NA	NA
Iron	0.56	0.6	NA	NA	0.40	<0.02	NA	NA
Lead	<0.05	<0.05	NA	NA	<0.05	<0.05	NA	NA
Chromium	<0.01	<0.01	NA	NA	<0.01	<0.01	NA	NA
Nickel	<0.01	<0.01	NA	NA	<0.01	<0.01	NA	NA
Beryllium	<0.01	NA	NA	<0.01	<0.01	<0.01	NA	NA
Molybdenum	<0.02	NA	NA	<0.02	<0.02	<0.02	NA	NA
Calcium	17.7	NA	8.9	8.0/8.2	8.5	<0.05	8.2	NA
Vanadium	<0.01	NA	NA	<0.01	<0.01	<0.01	NA	NA
Aluminum	0.4	NA	NA	0.18/0.20	0.3	<0.02	NA	NA
Magnesium	4	NA	2.2	1.95/2.00	2.1	<0.05	1.9	NA
Barium	0.02	NA	NA	0.02/0.02	0.01	<0.01	NA	NA
Potassium	1.55	NA	0.75	0.60/0.60	0.75	<0.05	0.6	NA
Strontium	0.07	NA	NA	0.03/0.04	0.04	<0.01	NA	NA
Sodium	9.0	NA	4.0	3.0/3.0	4.0	<0.5	4	NA
Mercury (ug/L)	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic (ug/L)	NA	NA	NA	NA	NA	NA	NA	NA
Selenium (ug/L)	NA	NA	NA	NA	NA	NA	NA	NA

NOTE: All Units are in (mg/L) unless otherwise specified
NA Not Analyzed

SURFACE WATER SITE	SW-2	SW-2	SW-2	SW-2	SW-2	SW-2 Trip Blank
Sample Date (mm/dd/yy)	08/13/88	09/24/88	10/22/88	12/02/88	04/11/89	04/11/89
BAS Reference Number	8808067-06	8809202-02	8810139-02	8812017-02	8904077-02	8904077-03
Sampling Level	2	1	2	1	2	2
PAHs (ug/L)						
Naphthalene	0.03	NA	0.01	NA	<0.1	<0.1
Acenaphthalene	<0.01	NA	<0.1	NA	<0.1	<0.1
Acenaphene	<0.01	NA	<0.1	NA	<0.1	<0.1
Fluorene	<0.01	NA	<0.1	NA	<0.1	<0.1
Phenanthrene	0.03	NA	<0.1	NA	<0.1	<0.1
Anthracene	<0.01	NA	<0.1	NA	<0.1	<0.1
Fluoranthene	<0.01	NA	<0.1	NA	<0.1	<0.1
Pyrene	<0.01	NA	<0.1	NA	<0.1	<0.1
Benzo(a)anthracene	<0.01	NA	<0.1	NA	<0.1	<0.1
Chrysene	<0.02	NA	<0.1	NA	<0.1	<0.1
Benzo(b)fluoranthene	<0.05	NA	<0.1	NA	<0.1	<0.1
Benzo(k)fluoranthene	<0.05	NA	*	NA	<0.1	<0.1
Benzo(a)pyrene	<0.05	NA	<0.1	NA	<0.1	<0.1
Perylene	<0.05	NA	<0.1	NA	<0.1	<0.1
Indelol(1,2,3-c,d)pyrene	<0.1	NA	<0.1		<0.1	<0.1
Dibenzo(a,h)anthracene	<0.2	NA	<0.1		<0.5	<0.5
Benzo(g,h,i)perylene	<0.1	NA	<0.1		<0.5	<0.5
Total PAHs**	0.06	NA	0.01	NA	ND	ND
Benzene	NA	NA	<2	NA	NA	NA
Toluene	NA	NA	<1	NA	NA	NA
Xylenes	NA	NA	<1	NA	NA	NA
Total BTX**	NA	NA	ND	NA	NA	NA

* The result for Benzo (b) fluorcenthene includes the combined concentration of both Benzo (b) plus Benzo (k) fluorcenthene

** Positve values only

SURFACE WATER SITE	SW-3 Rep-1	SW-3 Rep-2	SW-3	SW-3	SW-3	SW-3	SW-3	SW-3
Sample Date (mm/dd/yy)	08/13/88	08/13/88	9/24/88	10/22/88	12/02/88	04/11/89	05/12/89	06/16/89
BAS Reference Number	8808067-01	8808067-02	8809202-03	8810139-03	8812017-03	8904077-04	8905083	8906104
Sampling Level	1	1	1	2	1	2	1	1
pH	6.8	6.8	8.0	8.4	8.3	8.1	9.97	NA
Specific Conductance (uS/cm)	337	337	140	91	69	82	80	NA
Temperature (C)	18	18	12.5	7	3	1.5	9	NA
Dissolved Oxygen	8.1	8.1	NA	NA	NA	12.6	13.2	NA
Dissolved Inorganic Carbon	NA	NA	NA	NA	NA	5.0	NA	NA
Alkalinity (as CaCO3)	NA	NA	NA	32/32	33	32	24	NA
Sulphide	NA	NA	NA	NA	NA	NA	NA	NA
Total Cyanide	NA	NA	NA	NA	NA	0.002	NA	NA
Bromide	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	NA	NA
Chloride	19.8	21	14.7	12.1/11.9	10.1	13.8/13.8	NA	NA
Fluoride	0.08	0.08	0.08	0.04/0.04	0.07	0.05/0.06	NA	NA
Sulphate	11.3	11.6	13.8	13.7/13.4	13.0	10.0/10.0	NA	NA
Ammonia-N	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate-N	0.54	0.56	0.3	0.28/0.27	0.41	0.45/0.46	NA	NA
Total Kjeldahl Nitrogen	Na	NA	NA	0.28	0.27	0.31	0.22	NA
Total Phosphorus	NA	NA	NA	0.004	0.013	0.027	0.006	NA
Dissolved Organic Carbon	4.0	4.0	7.0/7.0	5.5	4.5	5.0	4.1	NA
Phenols	0.004	0.011	0.001	0.001	<0.001	0.003	<0.001	NA
PCB's	NA	NA	NA	NA	NA	NA	NA	NA
Oil and Grease	<1.0	3.0	<1	NA	NA	NA	NA	NA
Zinc	0.04	0.04	0.04	NA	NA	0.02/0.03	NA	NA
Cadmium	0.0002	0.0008	<0.0002	NA	NA	<0.05	NA	NA
Manganese	0.09	0.09	0.06	NA	NA	0.08/0.08	NA	NA
Cobalt	<0.01	<0.01	<0.01	NA	NA	<0.01	NA	NA
Copper	<0.005	<0.005	<0.005	NA	NA	<0.005	NA	NA
Iron	0.98	0.98	0.48	NA	NA	0.70/0.68	NA	NA
Lead	<0.05	<0.05	<0.05	NA	NA	<0.05	NA	NA
Chromium	<0.01	<0.01	<0.01	NA	NA	<0.01	NA	NA
Nickel	<0.01	<0.01	<0.01	NA	NA	<0.01	NA	NA
Beryllium	NA	NA	NA	NA	<0.01	<0.01	NA	NA
Molybdenum	NA	NA	NA	NA	<0.02	<0.02	NA	NA
Calcium	NA	NA	NA	14.5	13.4	13.1	11	NA
Vanadium	NA	NA	NA	NA	<0.01	<0.01	NA	NA
Aluminum	NA	NA	NA	NA	0.42	0.52	NA	NA
Magnesium	NA	NA	NA	3.2	3.5	3.4	2.7	NA
Barium	NA	NA	NA	NA	0.02	0.02	NA	NA
Potassium	NA	NA	NA	2.7	1.05	1.1	0.95	NA
Strontium	NA	NA	NA	NA	0.06	0.05	NA	NA
Sodium	NA	NA	NA	5.0	5.5	6.5	5	NA
Mercury (ug/L)	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic (ug/L)	NA	NA	NA	NA	NA	NA	NA	NA
Selenium (ug/L)	NA	NA	NA	NA	NA	NA	NA	NA

NOTE: All Units are in (mg/L) unless otherwise specified
NA Not Analyzed

SURFACE WATER SITE	SW-3 Rep-1	SW-3 Rep-2	SW-3	SW-3	SW-3	SW-3	SW-3	SW-3
Sample Date (mm/dd/yy)	08/13/88	08/13/88	9/24/88	10/22/88	12/02/88	04/11/89	05/12/89	06/16/89
BAS Reference Number	8808067-01	8808067-02		8810139-03	8812017-03	8904077-04	8905083	8906104
Sampling Level	1	1	1	2	1	2	1	1
PAHs (ug/L)								
Naphthalene	NA	NA	NA	<0.1	NA	<0.1	NA	NA
Acenaphthalene	NA	NA	NA	<0.1	NA	<0.1	NA	NA
Acenaphene	NA	NA	NA	<0.1	NA	<0.1	NA	NA
Fluorene	NA	NA	NA	<0.1	NA	<0.1	NA	NA
Phenanthrene	NA	NA	NA	0.2	NA	<0.1	NA	NA
Anthracene	NA	NA	NA	<0.1	NA	<0.1	NA	NA
Fluoranthene	NA	NA	NA	0.2	NA	<0.1	NA	NA
Pyrene	NA	NA	NA	0.1	NA	<0.1	NA	NA
Benzo(a)anthracene	NA	NA	NA	<0.1	NA	<0.1	NA	NA
Chrysene	NA	NA	NA	<0.1	NA	<0.1	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	<0.1	NA	<0.1	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	*	NA	<0.1	NA	NA
Benzo(a)pyrene	NA	NA	NA	<0.1	NA	<0.1	NA	NA
Perylene	NA	NA	NA	<0.1	NA	<0.1	NA	NA
Indelol(1,2,3-c,d)pyrene	NA	NA	NA	<0.1	NA	<0.1	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	<0.1	NA	<0.5	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	<	NA	<0.5	NA	NA
Total PAH's**	NA	NA	NA	0.5	NA	ND	NA	NA
Benzene	NA	NA	NA	<2	NA	NA	NA	NA
Toluene	NA	NA	NA	<1	NA	NA	NA	NA
Xylenes	NA	NA	NA	<1	NA	NA	NA	NA
Total BTX**	NA	NA	NA	ND	NA	NA	NA	NA

** Positive values only

SURFACE WATER SITE	SW-4	SW-4	SW-4	SW-4	SW-4	SW-4	SW-4
Sample Date (mm/dd/yy)	08/13/88	09/24/88	10/22/88	12/02/88	04/11/89	05/12/89	06/16/89
BAS Reference Number	8808067-3	8809202-4	8810139-04	8812017-04	8804077-05	8905083-04	8906104
Sampling Level	1	1	2	1	1	1	1
pH	7.7	7.8	7.5	8.6	9.4	6.56	8.2
Specific Conductance (uS/cm)	4220	3200	2620	1760	2400	2000	3490
Temperature (C)	23	18.5	8.5	1.5	4.5	12.5	16
Dissolved Oxygen	6.4	NA	NA	NA	7.9	8.8	8.3
Dissolved Inorganic Carbon	NA	NA	NA	NA	NA	NA	NA
Alkalinity (as CaCO3)	NA	NA	46	60	37/36	40	38
Sulphide	NA	NA	NA	NA	NA	NA	NA
Total Cyanide	NA	NA	NA	NA	0.002	NA	NA
Bromide	<1.0	<1.0	<1.0	<1.0	<0.5/0.5	NA	0.6
Chloride	1400	1170	1460	990/990	1260/1270	NA	270
Fluoride	1.0	1.0	1.25	1.0	090/0.70	NA	<1
Sulphate	210/210	270	260	220/230	165/170	NA	166
Ammonia-N	NA	NA	NA	NA	NA	NA	NA
Nitrate-N	<0.2	0.25	<0.2	0.2	<0.1/0.1	NA	<0.2
Total Kjeldahl Nitrogen	NA	NA	1.85	1.93	1.93	1.8	3.5
Total Phosphorus	NA	NA	0.002	0.013	0.088	0.005	0.006
Dissolved Organic Carbon	7.5/7.5	6	6	6	6.4	5.8	5.9
Phenols	0.034	0.27	0.72	0.32/0.32	0.35	0.059	0.036
PCB's	NA	NA	NA	NA	NA	NA	NA
Oil and Grease	4.0	5.0	NA	NA	NA	NA	NA
Zinc	0.02	0.02	NA	NA	0.01	NA	NA
Cadmium	0.0008	<0.0002	NA	NA	<0.005	NA	NA
Manganese	1.24	1.28	NA	NA	0.17	NA	NA
Cobalt	0.03	0.03	NA	NA	<0.01	NA	NA
Copper	0.005	0.01	NA	NA	<0.005	NA	NA
Iron	0.5	2.4	NA	NA	0.3	NA	NA
Lead	<0.05	<0.05	NA	NA	<0.05	NA	NA
Chromium	0.04	0.04	NA	NA	0.03	NA	NA
Nickel	0.02	0.02	NA	NA	0.01	NA	NA
Beryllium	NA	NA	NA	<0.01	<0.01	NA	NA
Molybdenum	NA	NA	NA	0.02	0.04	NA	NA
Calcium	NA	NA	600	480	560	480	NA
Vanadium	NA	NA	NA	0.03	0.04	NA	NA
Aluminum	NA	NA	NA	0.38	0.64	NA	NA
Magnesium	NA	NA	17	16.7	12.5	8.8	NA
Barium	NA	NA	NA	0.16	0.15	NA	NA
Potassium	NA	NA	44	34	35	33	NA
Strontium	NA	NA	NA	1.91	2.1	NA	NA
Sodium	NA	NA	92	58	105	78	NA
Mercury (ug/L)	NA	NA	NA	NA	NA	NA	NA
Arsenic (ug/L)	NA	NA	NA	NA	NA	NA	NA
Selenium (ug/L)	NA	NA	NA	NA	NA	NA	NA

NOTE: All Units are in (mg/L) unless otherwise specified
NA Not Analyzed

SURFACE WATER SITE	SW-4	SW-4	SW-4	SW-4	SW-4	SW-4	SW-4
Sample Date (mm/dd/yy)	08/13/88	09/24/88	10/22/88	12/02/88	04/11/89	05/12/89	06/16/89
BAS Reference Number	8808067-3	8809202-4	8810139-04	8808067-04	8808067-04	8905083	8906104
Sampling Level	1	1	2	1	2	1	1
PAHs (ug/L)							
Naphthalene	NA	NA	>500	NA	78	NA	NA
Acenaphthalene	NA	NA	17	NA	5.5	NA	NA
Acenaphene	NA	NA	14.4	NA	54	NA	NA
Fluorene	NA	NA	75	NA	27	NA	NA
Phenanthrene	NA	NA	87	NA	34	NA	NA
Anthracene	NA	NA	5.1	NA	3.2	NA	NA
Fluoranthene	NA	NA	7.1	NA	4.9	NA	NA
Pyrene	NA	NA	4.1	NA	2.4	NA	NA
Benzo(a)anthracene	NA	NA	0.2	NA	0.1	NA	NA
Chrysene	NA	NA	0.1	NA	0.1	NA	NA
Benzo(b)fluoranthene	NA	NA	<0.1	NA	<0.1	NA	NA
Benzo(k)fluoranthene	NA	NA	*	NA	<0.1	NA	NA
Benzo(a)pyrene	NA	NA	<0.1	NA	<0.1	NA	NA
Perylene	NA	NA	<0.1	NA	<0.1	NA	NA
Indelol(1,2,3-c,d)pyrene	NA	NA	<0.1	NA	<0.1	NA	NA
Dibenzo(a,h)anthracene	NA	NA	<0.1	NA	<0.5	NA	NA
Benzo(g,h,i)perylene	NA	NA	<0.1	NA	<0.5	NA	NA
Total PAHs**	NA	NA	>710	NA	209.2	NA	NA
Benzene	NA	NA	22	NA	NA	NA	NA
Toluene	NA	NA	13	NA	NA	NA	NA
Xylenes	NA	NA	30	NA	NA	NA	NA
Total BTX	NA	NA	65	NA	NA	NA	NA

* The result for Benzo (b) fluorcenthene includes the combined concentration of both Benzo (b) plus Benzo (k) fluorcenthene.

** Positive values only

SURFACE WATER SITE	SW-5	SW-5	SW-5	SW-5	SW-5 Rep 1	SW-5 Rep 2	SW-5	SW-5
Sample Date (mm/dd/yy)	08/13/88	09/24/88	10/22/88	12/02/88	04/11/89	04/11/89	05/12/89	06/16/89
BAS Reference Number	8808067-07	8809202-05	8810139-05	8812017	8904077-06	8904077-07	8905083	8906104
Sampling Level	2	1	2	1	2	2	1	1
pH	11.3	11.3	11.4	11.0	11.0		12.48	11.3
Specific Conductance (uS/cm)	5280	5930	6060	3350	3350		4200	11200
Temperature (C)	18	17.5	9	6	6		10.5	18
Dissolved Oxygen	6.1	NA	NA	NA	6.5		8.6	5.6
Dissolved Inorganic Carbon	4.0/4.0	NA	NA	NA	8.2	7.6	NA	NA
Alkalinity (as CaCO3)	230	NA	191	240	280	270	191/190	192
Sulphide	0.9	NA	NA	NA	NA	NA	NA	NA
Total Cyanide	NA	NA	NA	NA	0.04	0.025	NA	NA
Bromide	<2.0/2.0	<1	<5	<1	<0.5	<0.5	NA	<5
Chloride	1620	1620	2400	1210	1220	1200	NA	4100
Fluoride	<0.5	1.0	<2	1.0	1.1	0.9	NA	<1
Sulphate	580	530	640	600	560	560	NA	480
Ammonia-N	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate-N	<0.05	0.25	<1	0.2	0.60	0.60	NA	<1
Total Kjeldahl Nitrogen	5.8	NA	4.2/4.2	3.8	2.2	1.89	3.6/3.5	2.4
Total Phosphorus	NA	NA	0.003	0.011	0.001	0.009	0.007	0.01
Dissolved Organic Carbon	11	14.0	10.0	7.5	8.2	7.6	17	11.1
Phenols	0.041	0.023	0.022	0.013	0.052	0.015	0.015	0.05
PCB's	NA	NA	NA	NA	NA	NA	NA	NA
Oil and Grease	NA	2.0	NA	NA	NA	NA	NA	NA
Zinc	0.02	0.02/0.02	NA	NA	0.02	0.02/0.01	NA	NA
Cadmium	0.0002	<0.0002	NA	NA	<0.005	<0.005	NA	NA
Manganese	0.24/0.23	0.23/0.23	NA	NA	0.24	0.25/0.26	NA	NA
Cobalt	0.04	0.06/0.06	NA	NA	<0.01	<0.01	NA	NA
Copper	0.008	0.01	NA	NA	0.01	0.008	NA	NA
Iron	1.42	0.56	NA	NA	0.32	0.34/0.36	NA	NA
Lead	<0.05	<0.05	NA	NA	<0.05	<0.05	NA	NA
Chromium	0.05/0.06	0.07/0.07	NA	NA	0.06	0.06/0.06	NA	NA
Nickel	0.02/0.02	0.04/0.04	NA	NA	0.03	0.03/0.02	NA	NA
Beryllium	<0.01	NA	NA	<0.01	<0.01	<0.01	NA	NA
Molybdenum	0.06	NA	NA	0.06	0.08	0.8	NA	NA
Calcium	1040	NA	1700	930	850	890	1250	NA
Vanadium	0.05	NA	4.7	0.05	0.05	0.05	NA	NA
Aluminum	0.68	NA	NA	0.68	0.8	0.84	NA	NA
Magnesium	3.0	NA	4.7	5.2	5.2	5.2	2	NA
Barium	0.21	NA	NA	0.15	0.12	0.12	NA	NA
Potassium	110	NA	112	102	84	84	125	NA
Strontium	3.8	NA	NA	3.2	3	3	NA	NA
Sodium	55	NA	65	47	47	48	56	NA
Mercury (ug/L)	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic (ug/L)	NA	NA	NA	NA	NA	NA	NA	NA
Selenium (ug/L)	NA	NA	NA	NA	NA	NA	NA	NA

NOTE: All Units are in (mg/L) unless otherwise specified
NA Not Analyzed

SURFACE WATER SITE	SW-5	SW-5	SW-5	SW-5	SW-5 Rep 1	SW-5 Rep 2	SW-5	SW-5
Sample Date (mm/dd/yy)	08/13/88	09/24/88	10/22/88	12/02/88	04/11/89	04/11/89	05/12/89	06/16/89
BAS Reference Number	8808067-07	8809202-05	8810139-05		8904077-06	8904077-07	8905083	8906104
Sampling Level	2	1	2	1	2	2	1	1
PAHs (ug/L)								
Naphthalene	2.1	NA	270	NA	39	37	NA	NA
Acenaphthalene	0.013	NA	0.3	NA	0.4	0.4	NA	NA
Acenaphene	0.41	NA	0.9	NA	1.4	1.3	NA	NA
Fluorene	0.57	NA	0.8	NA	1.0	1.0	NA	NA
Phenanthrene	1.05	NA	1.6	NA	2.5	2.4	NA	NA
Anthracene	0.15	NA	<0.1	NA	0.3	0.3	NA	NA
Fluoranthene	0.55	NA	0.7	NA	0.9	0.8	NA	NA
Pyrene	0.41	NA	0.4	NA	0.6	0.6	NA	NA
Benzo(a)anthracene	<0.02	NA	<0.1	NA	<0.1	<0.1	NA	NA
Chrysene	0.02	NA	<0.1	NA	<0.1	<0.1	NA	NA
Benzo(b)fluoranthene	<0.05	NA	<0.1	NA	<0.1	<0.1	NA	NA
Benzo(k)fluoranthene	<0.05	NA	*	NA	<0.1	<0.1	NA	NA
Benzo(a)pyrene	<0.05	NA	<0.1	NA	<0.1	<0.1	NA	NA
Perylene	<0.05	NA	<0.1	NA	<0.1	<0.1	NA	NA
Indelol(1,2,3-c,d)pyrene	<0.1	NA	<0.1	NA	<0.1	<0.1	NA	NA
Dibenzo(a,h)anthracene	<0.02	NA	<0.1	NA	<0.5	<0.5	NA	NA
Benzo(g,h,i)perylene	<0.02	NA	<0.1	NA	<0.5	<0.5	NA	NA
Total PAHs**	NA	NA	274.7	NA	46.1	43.8	NA	NA
Benzene	NA	NA	3.5	NA	NA	NA	NA	NA
Toluene	NA	NA	<1	NA	NA	NA	NA	NA
Xylenes	NA	NA	3	NA	NA	NA	NA	NA
Total BTX**	NA	NA	6.5	NA	NA	NA	NA	NA

* The result for Benzo (b) fluorcenthene includes the combined concentration of both Benzo (b) plus Benzo (k) fluorcenthene.
** Positive values only

SURFACE WATER SITE	SW-6	SW-6	SW-6	SW-6	SW-6 Trip Blank	SW-6
Sample Date (mm/dd/yy)	08/13/88	09/24/88	10/22/88	12/02/88	12/02/88	04/11/89
BAS Reference Number	8808067-04			8812017-06	8812017-07	8904077-08
Sampling Level	1	1	1	1	1	2
pH	8.9	NA	NA	8.9		11.4
Specific Conductance (uS/cm)	6330	NA	NA	1912		2100
Temperature (C)	22.5	NA	NA	4.5		5
Dissolved Oxygen	4.5	NA	NA	4.1		NA
Dissolved Inorganic Carbon	NA	NA	NA	NA	NA	NA
Alkalinity (as CaCO3)	NA	NA	NA	59	2/2	84
Sulphide	NA	NA	NA	NA	NA	NA
Total Cyanide	NA	NA	NA	NA	NA	0.004
Bromide	<2.0	NA	NA	<1	<0.5	<0.5
Chloride	2200	NA	NA	700	<0.01	1010
Fluoride	1.0	NA	NA	1.0	<0.01	0.5
Sulphate	210/230	NA	NA	168	<0.2	130
Ammonia-N	NA	NA	NA	NA	NA	NA
Nitrate-N	2.5	NA	NA	<0.2	<0.01	0.1
Total Kjeldahl Nitrogen	NA	NA	NA	2.2	<0.05	2.1
Total Phosphorus	NA	NA	NA	0.014	<0.001	0.006
		NA	NA			
Dissolved Organic Carbon	9.0	NA	NA	7.0	<0.5	10.8
Phenols	0.6	NA	NA	0.57	<0.001	1.7
PCB's	NA	NA	NA	NA	NA	NA
Oil and Grease	5.0	NA	NA	NA	NA	NA
Zinc	0.02	NA	NA	NA	NA	0.03
Cadmium	0.0008	NA	NA	NA	NA	<0.005
Manganese	0.1	NA	NA	NA	NA	0.1
Cobalt	0.04	NA	NA	NA	NA	<0.01
Copper	0.005	NA	NA	NA	NA	0.01
Iron	0.14	NA	NA	NA	NA	0.38
Lead	<0.05	NA	NA	NA	NA	<0.05
Chromium	0.06	NA	NA	NA	NA	0.03
Nickel	0.02	NA	NA	NA	NA	0.01
Beryllium	NA	NA	NA	<0.01	<0.01	<0.01
Molybdenum	NA	NA	NA	0.02	<0.02	0.04
Calcium	NA	NA	NA	430	<0.05	560
Vanadium	NA	NA	NA	0.03	<0.01	0.04
Aluminum	NA	NA	NA	0.34	<0.05	0.76
Magnesium	NA	NA	NA	12.3	<0.05	1.55
Barium	NA	NA	NA	0.14	<0.01	0.17
Potassium	NA	NA	NA	32	<0.05	36
Strontium	NA	NA	NA	1.63	<0.01	2
Sodium	NA	NA	NA	47	<0.5	40
Mercury (ug/L)	NA	NA	NA	NA	NA	NA
Arsenic (ug/L)	NA	NA	NA	NA	NA	NA
Selenium (ug/L)	NA	NA	NA	NA	NA	NA

NOTE: All Units are in (mg/L) unless otherwise specified
NA Not Analyzed

SURFACE WATER SITE	SW-6	SW-6	SW-6	SW-6	SW-6	SW-6
Sample Date (mm/dd/yy)	08/13/88	09/24/88	10/22/88	12/02/88	12/02/88	04/11/89
BAS Reference Number	8808067-04			8812017-06	8812017-07	8904077-08
Sampling Level	1	1	1	1	1	2
PAH's (ug/L)						
Naphthalene	NA	NA	NA	NA	NA	70
Acenaphthalene	NA	NA	NA	NA	NA	18
Acenaphene	NA	NA	NA	NA	NA	160
Fluorene	NA	NA	NA	NA	NA	76
Phenanthrene	NA	NA	NA	NA	NA	96
Anthracene	NA	NA	NA	NA	NA	12
Fluoranthene	NA	NA	NA	NA	NA	13
Pyrene	NA	NA	NA	NA	NA	9.1
Benzo(a)anthracene	NA	NA	NA	NA	NA	0.4
Chrysene	NA	NA	NA	NA	NA	0.4
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	0.1
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	0.1
Benzo(a)pyrene	NA	NA	NA	NA	NA	0.2
Perylene	NA	NA	NA	NA	NA	<0.1
Indelol(1,2,3-c,d)pyrene	NA	NA	NA	NA	NA	<0.1
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	<0.5
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	<0.5
Total PAH's**	NA	NA	NA	NA	NA	455.3

** Positive values only

SURFACE WATER SITE	SW-7
Sample Date (mm/dd/yy)	08/13/88
BAS Reference Number	8808067-07
Sampling Level	1
pH	7.7
Specific Conductance (uS/cm)	145
Temperature (C)	17
Dissolved Oxygen	NA
Dissolved Inorganic Carbon	NA
Alkalinity (as CaCO3)	NA
Sulphide	NA
Total Cyanide	NA
Bromide	<0.1
Chloride	12.4/12.6
Fluoride	0.06/0.10
Sulphate	11.1/11.5
Ammonia-N	NA
Nitrate-N	0.70/0.72
Total Kjeldahl Nitrogen	NA
Total Phosphorus	NA
Dissolved Organic Carbon	3.5
Phenols	0.011
PCB's	NA
Oil and Grease	2.0
Zinc	0.05
Cadmium	0.0004
Manganese	0.05
Cobalt	<0.01
Copper	<0.005
Iron	0.6
Lead	<0.05
Chromium	<0.01
Nickel	<0.01
Beryllium	NA
Molybdenum	NA
Calcium	NA
Vanadium	NA
Aluminum	NA
Magnesium	NA
Barium	NA
Potassium	NA
Strontium	NA
Sodium	NA
Mercury (ug/L)	NA
Arsenic (ug/L)	NA
Selenium (ug/L)	NA

NOTE: All Units are in (mg/L) unless otherwise s
NA Not Analyzed

SURFACE WATER SITE	SW-8
Sample Date (mm/dd/yy)	06/16/89
BAS Reference Number	8906104
Sampling Level	2
pH	8.9
Specific Conductance (uS/cm)	48
Temperature (C)	15
Dissolved Oxygen	9.2
Dissolved Inorganic Carbon	NA
Alkalinity (as CaCO3)	39
Sulphide	NA
Total Cyanide	0.003
Bromide	<0.2
Chloride	136
Fluoride	<0.05
Sulphate	26
Ammonia-N	NA
Nitrate-N	0.4
Total Kjeldahl Nitrogen	0.64
Total Phosphorus	0.004
Dissolved Organic Carbon	6.9
Phenols	0.008
PCB's	NA
Oil and Grease	NA
Zinc	NA
Cadmium	NA
Manganese	NA
Cobalt	NA
Copper	NA
Iron	NA
Lead	NA
Chromium	NA
Nickel	NA
Beryllium	NA
Molybdenum	NA
Calcium	NA
Vanadium	NA
Aluminum	NA
Magnesium	NA
Barium	NA
Potassium	NA
Strontium	NA
Sodium	NA
Mercury (ug/L)	NA
Arsenic (ug/L)	NA
Selenium (ug/L)	NA

NOTE: All Units are in (mg/L) unless otherwise s
NA Not Analyzed

SURFACE WATER SITE	SW-8
Sample Date (mm/dd/yy)	06/16/89
BAS Reference Number	8906104
Sampling Level	2
PAHs (ug/L)	
Naphthalene	<0.1
Acenaphthalene	<0.1
Acenaphene	0.8
Fluorene	0.2
Phenanthrene	0.2
Anthracene	<0.1
Fluoranthene	0.1
Pyrene	0.3
Benzo(a)anthracene	<0.2
Chrysene	<0.2
Benzo(b)fluoranthene	<0.2
Benzo(k)fluoranthene	<0.2
Benzo(a)pyrene	<0.5
Perylene	<0.5
Indelol(1,2,3-c,d)pyrene	<0.5
Dibenzo(a,h)anthracene	<0.5
Benzo(g,h,i)perylene	<0.5
Total PAHs**	1.6
Benzene	NA
Toluene	NA
Xylenes	NA

** Positve values only

SURFACE WATER SITE	SW-9
Sample Date (mm/dd/yy)	06/16/89
BAS Reference Number	8906104
Sampling Level	2
pH	9.1
Specific Conductance (uS/cm)	49
Temperature (C)	15
Dissolved Oxygen	9.6
Dissolved Inorganic Carbon	NA
Alkalinity (as CaCO3)	37
Sulphide	NA
Total Cyanide	<0.002
Bromide	<0.2
Chloride	145
Fluoride	<0.05
Sulphate	24
Ammonia-N	NA
Nitrate-N	0.48
Total Kjeldahl Nitrogen	0.58/0.62
Total Phosphorus	0.007
Dissolved Organic Carbon	5.6/5.3
Phenols	0.002
PCB's	NA
Oil and Grease	NA
Zinc	NA
Cadmium	NA
Manganese	NA
Cobalt	NA
Copper	NA
Iron	NA
Lead	NA
Chromium	NA
Nickel	NA
Beryllium	NA
Molybdenum	NA
Calcium	NA
Vanadium	NA
Aluminum	NA
Magnesium	NA
Barium	NA
Potassium	NA
Strontium	NA
Sodium	NA
Mercury (ug/L)	NA
Arsenic (ug/L)	NA
Selenium (ug/L)	NA

NOTE: All Units are in (mg/L) unless otherwise s
NA Not Analyzed

SURFACE WATER SITE	SW-9
Sample Date (mm/dd/yy)	06/16/89
BAS Reference Number	8906104
Sampling Level	2
PAHs (ug/L)	
Naphthalene	<0.1
Acenaphthalene	<0.1
Acenaphene	0.1
Fluorene	0.1
Phenanthrene	0.2
Anthracene	<0.1
Fluoranthene	0.9
Pyrene	0.6
Benzo(a)anthracene	<0.2
Chrysene	<0.2
Benzo(b)fluoranthene	<0.2
Benzo(k)fluoranthene	<0.2
Benzo(a)pyrene	<0.5
Perylene	<0.5
Indelol(1,2,3-c,d)pyrene	<0.5
Dibenzo(a,h)anthracene	<0.5
Benzo(g,h,i)perylene	<0.5
Total PAHs**	1.9
Benzene	NA
Toluene	NA
Xylenes	NA
Total BTX**	NA

** Positve values only

CONCENTRATION OF VOLATILE PRIORITY POLLUTANTS IN WATER
ug/L

COMPOUND	SW1	SW2	SW5	BLANK	MDL
BENZENE	-	-	5.6	-	1
BROMODICHLOROMETHANE	-	-	-	-	1
BROMOFORM	-	-	-	-	2
BROMOMETHANE	-	-	-	-	16
CARBON TETRACHLORIDE	-	-	-	-	2
CHLOROBENZENE	-	-	-	-	1
CHLOROETHANE	-	-	-	-	10
2-CHLOROETHYL VINYL ETHER	-	-	-	-	10
CHLOROFORM	-	-	-	-	1
CHLOROMETHANE	-	-	-	-	50
DIBROMOCHLOROMETHANE	-	-	-	-	1
1,2-DICHLOROBENZENE	-	-	-	-	1
1,3-DICHLOROBENZENE	-	-	-	-	1
1,4-DICHLOROBENZENE	-	-	-	-	1
1,1-DICHLOROETHYLENE	-	-	-	-	1
1,1-DICHLOROETHANE	-	-	-	-	1
1,2-DICHLOROETHANE	-	-	-	-	2
TRANS-1,2-DICHLOROETHYLENE	-	-	-	-	1
DICHLOROMETHANE	-	-	-	-	15
1,2-DICHLOROPROPANE	-	-	-	-	1
CIS-1,3-DICHLOROPROPENE	-	-	-	-	1
TRANS-1,3-DICHLOROPROPENE	-	-	-	-	1
ETHYLBENZENE	-	-	-	-	1
A-METHYLSTYRENE	-	-	-	-	1
METHYLSTYRENE ISOMERS	-	-	-	-	1
MESITYLENE	-	-	-	-	1
1,1,2,2-TETRACHLOROETHANE	-	-	-	-	2
TETRACHLOROETHYLENE	1.4	1.7	1	-	1
TOLUENE	-	-	4.8	-	2
1,1,1-TRICHLOROETHANE	-	-	-	-	2
1,1,2-TRICHLOROETHANE	-	-	-	-	1
TRICHLOROETHYLENE	-	-	-	-	1
TRICHLOROFLUOROMETHANE	-	-	-	-	2
M+P-XYLENE	-	-	1.1	-	2
O-XYLENE	-	-	TR	-	1
VINYL CHLORIDE	-	-	-	-	12
METHYL ETHYL KETONE	-	-	-	-	20
CUMEN	-	-	-	-	1
PROPYL BENZENE	-	-	-	-	1
M+P-ETHYL TOLUENE	-	-	-	-	1
O-ETHYL TOLUENE	-	-	-	-	1
DIBROMOETHANE	-	-	-	-	5
CIS-1,2-DICHLOROETHYLENE	-	-	-	-	1
STYRENE	-	-	-	-	2
OTHER AROMATIC COMPOUNDS	-	-	6.3	-	1

MDL = METHOD DETECTION LIMITS
TR - TRACE

OTHER AROMATIC COMPOUNDS = Total concentration of trimethylbenzenes using the response factor of mesitylene.

CONCENTRATION OF ACIDIC PRIORITY POLLUTANTS IN WATER
ug/L

COMPOUND	SW 1	BLANK	MDL
PHENOL	-	-	1
2-CHLOROPHENOL	-	-	1
2,4-DIMETHYLPHENOL	-	-	1
4-CHLORO-3-METHYLPHENOL	-	-	1
2,4-DICHLOROPHENOL	-	-	1
2,4,6-TRICHLOROPHENOL	-	-	1
2-NITROPHENOL	-	-	2
2,4-DINITROPHENOL	-	-	100
2-METHYL-4,6-DINITROPHENOL	-	-	25
4-NITROPHENOL	-	-	100
PENTACHLOROPHENOL	-	-	1
2,6-DICHLOROPHENOL	-	-	1
2,3,4-TRICHLOROPHENOL	-	-	1
2,3,5-TRICHLOROPHENOL	-	-	1
2,4,5-TRICHLOROPHENOL	-	-	1
2,3,4,5-TETRACHLOROPHENOL	-	-	1
2,3,4,6-TETRACHLOROPHENOL	-	-	1
2,3,5,6-TETRACHLOROPHENOL	-	-	1
M-CRESOL	-	-	1
P-CRESOL	-	-	1
O-CRESOL	-	-	1
OTHER DIMETHYL PHENOLS	-	-	1
TRIMETHYL PHENOLS	-	-	1

MDL = METHOD DETECTION LIMIT

RECOVERY OF SURROGATE STANDARDS
(%)

COMPOUND	SW 1	BLANK
D5-PHENOL	92.5	100
TRIFLUOROMETHYL-M-CRESOL	94.8	100

Free Product and Bennett Creek Sediment Sample Concentrations

	Free Product	Bennett Creek Sediment
Sample Date (mm/dd/yy)	05/12/89	06/19/89
BAS Reference Number	8905085	8905084
PAHs		
Naphthalene	40000	94/110
Acenaphthalene	3100	64/15
Acenaphthene	4700	240/220
Fluorene	3000	190/180
Phenanthrene	1500	115/100
Anthracene	16000	150/290
Fluoranthene	2600	320/290
Pyrene	2300	280/260
Benzo(a)anthracene	14000	73/70
Chrysene	8200	53/100
Benzo(b)fluoranthene	14000	79/72
Benzo(k)fluoranthene	7800	46/44
Benzo(a)pyrene	21000	120/110
Perylene	3800	23/20
Indelol(1,2,3-c,d)pyrene	1300	7.7/7.1
Dibenzo(a,h)anthracene	3200	21/20
Benzo(g,h,i)perylene	6300	41/36
Loss on Ignition	NA	1.0
Moisture	NA	53.6
Total PAHs*	152800	1935.4
CHLOROPHENOLS		
Phenol	6.0	4.0
o-cresol	<2	NA
m-cresol	3.2	NA
p-cresol	2.6	NA
2-Chlorophenol	<2	NA
2,4-Dimethylphenol	4.6	NA
2,6-Dichlorophenol	<2	NA
4-Chloro-3-Methylphenol	49.0	NA
2,4-Dichlorophenol	<2	NA
2,4,6-Dichlorophenol	<2	NA
4-nitrophenol	2700	NA
2,3,5-Trichlorophenol	<2	NA
2,4,5-Trichlorophenol	<2	NA
2,3,4-Trichlorophenol	<2	NA
2,3,5,6-Tetrachlorophenol	<2	NA
2,4-Dinitrophenol	38	NA
2,3,4,6-Tetrachlorophenol	<2	NA
2,3,4,5-Tetrachlorophenol	<2	NA
4,6-Dinitro-o-cresol	60	NA
Pentachlorophenol	<2	NA
Total Chlorophenols*	2863.4	4.0

NOTE : All units in ug/g unless otherwise noted

* Positive values only
NA Not Analyzed

TABLE A11.2: REGRESSION ANALYSIS BETWEEN REPLICATE SAMPLES COLLECTED AT SW3 AND SW5

Station	Y Intercept	R^2	Slope	St. Error of Slope	Degree of Freedom
SW3	0.103	0.992	1.054	0.021	15
SW5	0.104	0.999	1.003	0.005	29

APPENDIX 12

SURFACE WATER QUALITY SUMMARY STATISTICS

[redacted]

Summary of Water Quality Data for Station All outfalls considered

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
PH	pHu	40	40	8.60	8.00	1.61	12.5	6.50
SC	us/c	39	39	1843	171	2520	11200	44.8
Temp	DegC	40	39	11.4	11.0	6.75	23.5	1.00
DO	mg/L	22	22	9.05	8.50	3.20	16.4	4.10
DIC	mg/L	5	5	9.84	8.20	6.00	18.0	4.00
ALK	mg/L	31	31	72.0	37.0	76.9	280	16.0
SO3	mg/L	3	1	0.900			0.900	0.900
TC	mg/L	9	7	0.0083	0.0030	0.0140	0.0400	0.0020
Br	mg/L	35	2	1.30			2.00	0.600
Cl	mg/L	35	35	660	19.8	940	4100	4.50

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-1

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
PH	pHu	7	7	7.24	7.50	0.541	7.80	6.50
SC	us/c	7	7	135	101	84.6	321	80.0
Temp	DegC	7	6	12.3	13.2	7.83	23.5	1.00
DO	mg/L	4	4	11.4	10.5	3.83	16.4	8.00
DIC	mg/L	1	1	18.0			18.0	18.0
ALK	mg/L	6	6	32.7	25.5	16.0	64.0	22.0
SO3	mg/L	1	0					
TC	mg/L	2	2	0.0035			0.0040	0.0030
Br	mg/L	6	0					
Cl	mg/L	6	6	10.4	9.00	4.58	18.2	6.00

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-2

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
PH	pHu	7	7	7.62	7.90	0.469	8.00	6.75
SC	us/c	6	6	79.0	66.0	46.1	171	44.8
Temp	DegC	7	7	10.1	9.00	7.65	21.5	1.00
DO	mg/L	3	3	11.4	11.0	3.22	14.8	8.40
DIC	mg/L	1	1	14.0			14.0	14.0
ALK	mg/L	6	6	25.3	19.5	13.7	52.0	16.0
SO3	mg/L	1	0					
TC	mg/L	1	0					
Br	mg/L	6	0					
Cl	mg/L	6	6	7.79	6.40	3.70	13.8	4.50

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-3

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
PH	pHu	6	6	8.26	8.20	1.02	9.97	6.80
SC	us/c	6	6	133	86.5	103	337	69.0
Temp	DegC	6	6	8.50	8.00	6.13	18.0	1.50
DO	mg/L	3	3	11.3	12.6	2.79	13.2	8.10
DIC	mg/L	1	1	5.00			5.00	5.00
ALK	mg/L	4	4	30.2	32.0	4.19	33.0	24.0
SO3	mg/L	0	0					
TC	mg/L	1	1	0.0020			0.0020	0.0020
Br	mg/L	5	0					
Cl	mg/L	5	5	14.1	13.8	3.65	19.8	10.1

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-4

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
PH	pHu	7	7	7.97	7.80	0.895	9.40	6.56
SC	us/c	7	7	2813	2620	872	4220	1760
Temp	DegC	7	7	12.1	12.5	7.73	23.0	1.50
DO	mg/L	4	4	7.85	8.10	1.03	8.80	6.40
DIC	mg/L	0	0					
ALK	mg/L	5	5	44.1	40.0	9.59	60.0	36.5
SO3	mg/L	0	0					
TC	mg/L	1	1	0.0020			0.0020	0.0020
Br	mg/L	6	1	0.600			0.600	0.600
Cl	mg/L	6	6	1093	1218	436	1460	270

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-5

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
PH	pHu	7	7	11.4	11.3	0.503	12.5	11.0
SC	us/c	7	7	5624	5280	2704	11200	3350
Temp	DegC	7	7	12.1	10.5	5.56	18.0	6.00
DO	mg/L	4	4	6.70	6.30	1.32	8.60	5.60
DIC	mg/L	2	2	6.10			8.20	4.00
ALK	mg/L	6	6	221	211	36.3	280	191
SO3	mg/L	1	1	0.900			0.900	0.900
TC	mg/L	1	1	0.0400			0.0400	0.0400
Br	mg/L	6	1	2.00			2.00	2.00
Cl	mg/L	6	6	2028	1620	1103	4100	1210

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-6

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
PH	pHu	3	3	9.73	8.90	1.44	11.4	8.90
SC	us/c	3	3	3447	2100	2498	6330	1912
Temp	DegC	3	3	10.7	5.00	10.3	22.5	4.50
DO	mg/L	2	2	4.30			4.50	4.10
DIC	mg/L	0	0					
ALK	mg/L	2	2	71.5			84.0	59.0
SO3	mg/L	0	0					
TC	mg/L	1	1	0.0040			0.0040	0.0040
Br	mg/L	3	0					
Cl	mg/L	3	3	1303	1010	792	2200	700

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station All outfalls considered

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
F	mg/L	35	29	0.405	0.0800	0.463	1.25	0.0030
SO4	mg/L	35	35	159	26.0	206	640	5.75
NH4-N	mg/L	1	1	0.500			0.500	0.500
NO3-N	mg/L	35	27	0.351	0.240	0.466	2.50	0.0400
TkN	mg/L	31	31	1.43	0.600	1.47	5.80	0.220
TP	mg/L	29	29	0.0113	0.0070	0.0157	0.0880	0.0010
DOC	mg/L	40	40	7.17	6.20	2.72	17.0	3.50
Phnol	mg/L	40	26	0.189	0.0285	0.373	1.70	0.0010
PCB	mg/L	1	0					
OILGRS	mg/L	10	7	3.00	2.00	1.63	5.00	1.00

Note: N-number of observations, ND-number detected

Summary of Water Quality Data for Station Algoma SW-1

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
F	mg/L	6	6	0.0700	0.0600	0.0253	0.120	0.0500
SO4	mg/L	6	6	28.2	23.5	13.1	51.0	16.0
NH4-N	mg/L	1	1	0.500			0.500	0.500
NO3-N	mg/L	6	6	0.188	0.130	0.157	0.480	0.0400
TkN	mg/L	6	6	0.486	0.477	0.144	0.710	0.320
TP	mg/L	6	6	0.0087	0.0075	0.0036	0.0150	0.0060
DOC	mg/L	7	7	6.64	5.90	1.43	9.50	5.50
Phnol	mg/L	7	1	0.0060			0.0060	0.0060
PCB	mg/L	1	0					
OILGRS	mg/L	2	1	1.00			1.00	1.00

Note: N-number of observations, ND-number detected

Summary of Water Quality Data for Station Algoma SW-2

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
F	mg/L	6	6	0.0422	0.0450	0.0277	0.0800	0.0030
SO4	mg/L	6	6	9.06	9.00	1.90	11.2	5.75
NH4-N	mg/L	0	0					
NO3-N	mg/L	6	6	0.182	0.130	0.145	0.460	0.0700
TkN	mg/L	6	6	0.293	0.285	0.0408	0.370	0.260
TP	mg/L	5	5	0.0096	0.0090	0.0043	0.0160	0.0040
DOC	mg/L	7	7	6.43	5.80	1.47	9.00	5.00
Phnol	mg/L	7	1	0.0030			0.0030	0.0030
PCB	mg/L	0	0					
OILGRS	mg/L	1	1	2.00			2.00	2.00

Note: N-number of observations, ND-number detected

Summary of Water Quality Data for Station Algoma SW-3

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
F	mg/L	5	5	0.0650	0.0700	0.0173	0.0800	0.0400
SO4	mg/L	5	5	12.3	13.0	1.63	13.8	10.0
NH4-N	mg/L	0	0					
NO3-N	mg/L	5	5	0.314	0.300	0.183	0.540	0.0450
TkN	mg/L	4	4	0.270	0.275	0.0374	0.310	0.220
TP	mg/L	4	4	0.0125	0.0095	0.0104	0.0270	0.0040
DOC	mg/L	6	6	5.02	4.75	1.12	7.00	4.00
Phnol	mg/L	6	4	0.0023	0.0020	0.0015	0.0040	0.0010
PCB	mg/L	0	0					
OILGRS	mg/L	2	0					

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-4

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
F	mg/L	6	5	1.01	1.00	0.160	1.25	0.800
SO4	mg/L	6	6	216	218	44.4	270	166
NH4-N	mg/L	0	0					
NO3-N	mg/L	6	3	0.183	0.200	0.0764	0.250	0.100
TkN	mg/L	5	5	2.20	1.93	0.728	3.50	1.80
TP	mg/L	5	5	0.0228	0.0060	0.0367	0.0880	0.0020
DOC	mg/L	7	7	6.23	6.00	0.591	7.50	5.80
Phnol	mg/L	7	7	0.256	0.270	0.247	0.720	0.0340
PCB	mg/L	0	0					
OILGRS	mg/L	2	2	4.50			5.00	4.00

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-5

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
F	mg/L	6	3	1.03	1.00	0.0577	1.10	1.00
SO4	mg/L	6	6	565	570	55.8	640	480
NH4-N	mg/L	0	0					
NO3-N	mg/L	6	3	0.350	0.250	0.218	0.600	0.200
TkN	mg/L	6	6	3.66	3.67	1.31	5.80	2.20
TP	mg/L	5	5	0.0064	0.0070	0.0043	0.0110	0.0010
DOC	mg/L	7	7	11.3	11.0	3.31	17.0	7.50
Phnol	mg/L	7	7	0.0309	0.0230	0.0165	0.0520	0.0130
PCB	mg/L	0	0					
OILGRS	mg/L	1	1	2.00			2.00	2.00

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-6

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
F	mg/L	3	3	0.833	1.00	0.289	1.00	0.500
SO4	mg/L	3	3	173	168	45.2	220	130
NH4-N	mg/L	0	0					
NO3-N	mg/L	3	1	2.50			2.50	2.50
TkN	mg/L	2	2	2.15			2.20	2.10
TP	mg/L	2	2	0.0100			0.0140	0.0060
DOC	mg/L	3	3	8.93	9.00	1.90	10.8	7.00
Phnol	mg/L	3	3	0.957	0.600	0.644	1.70	0.570
PCB	mg/L	0	0					
OILGRS	mg/L	1	1	5.00			5.00	5.00

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station All outfalls considered

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Zn	mg/L	18	15	0.0243	0.0200	0.0112	0.0500	0.0100
Cd	mg/L	18	4	0.0010	0.0010		0.0010	0.0010
Mn	mg/L	18	18	0.242	0.0950	0.377	1.28	0.0300
Co	mg/L	18	5	0.0400	0.0400	0.0122	0.0600	0.0300
Cu	mg/L	18	7	0.0083	0.0100	0.0024	0.0100	0.0050
Fe	mg/L	18	18	0.835	0.560	0.767	3.10	0.140
Pb	mg/L	18	0					
Cr	mg/L	18	8	0.0494	0.0500	0.0161	0.0700	0.0300

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-1

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Zn	mg/L	3	1	0.0200			0.0200	0.0200
Cd	mg/L	3	1	0.0010			0.0010	0.0010
Mn	mg/L	3	3	0.113	0.0600	0.101	0.230	0.0500
Co	mg/L	3	0					
Cu	mg/L	3	0					
Fe	mg/L	3	3	1.57	1.04	1.35	3.10	0.560
Pb	mg/L	3	0					
Cr	mg/L	3	0					

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-2

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Zn	mg/L	3	3	0.0133	0.0100	0.0058	0.0200	0.0100
Cd	mg/L	3	1	0.0010			0.0010	0.0010
Mn	mg/L	3	3	0.0500	0.0400	0.0265	0.0800	0.0300
Co	mg/L	3	0					
Cu	mg/L	3	0					
Fe	mg/L	3	3	0.520	0.560	0.106	0.600	0.400
Pb	mg/L	3	0					
Cr	mg/L	3	0					

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-3

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Zn	mg/L	3	3	0.0350	0.0400	0.0087	0.0400	0.0250
Cd	mg/L	3	0					
Mn	mg/L	3	3	0.0767	0.0800	0.0153	0.0900	0.0600
Co	mg/L	3	0					
Cu	mg/L	3	0					
Fe	mg/L	3	3	0.717	0.690	0.251	0.980	0.480
Pb	mg/L	3	0					
Cr	mg/L	3	0					

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-4

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Zn	mg/L	3	2	0.0200			0.0200	0.0200
Cd	mg/L	3	1	0.0010			0.0010	0.0010
Mn	mg/L	3	3	0.897	1.24	0.630	1.28	0.170
Co	mg/L	3	2	0.0300			0.0300	0.0300
Cu	mg/L	3	2	0.0075			0.0100	0.0050
Fe	mg/L	3	3	1.07	0.500	1.16	2.40	0.300
Pb	mg/L	3	0					
Cr	mg/L	3	3	0.0367	0.0400	0.0058	0.0400	0.0300

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-5

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Zn	mg/L	3	3	0.0200	0.0200		0.0200	0.0200
Cd	mg/L	3	0					
Mn	mg/L	3	3	0.235	0.235	0.0050	0.240	0.230
Co	mg/L	3	2	0.0500			0.0600	0.0400
Cu	mg/L	3	3	0.0093	0.0100	0.0012	0.0100	0.0080
Fe	mg/L	3	3	0.767	0.560	0.578	1.42	0.320
Pb	mg/L	3	0					
Cr	mg/L	3	3	0.0650	0.0650	0.0050	0.0700	0.0600

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-6

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Zn	mg/L	2	2	0.0250			0.0300	0.0200
Cd	mg/L	2	1	0.0010			0.0010	0.0010
Mn	mg/L	2	2	0.100			0.100	0.100
Co	mg/L	2	1	0.0400			0.0400	0.0400
Cu	mg/L	2	2	0.0075			0.0100	0.0050
Fe	mg/L	2	2	0.260			0.380	0.140
Pb	mg/L	2	0					
Cr	mg/L	2	2	0.0450			0.0600	0.0300

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station All outfalls considered

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Ni	mg/L	18	8	0.0213	0.0200	0.0099	0.0400	0.0100
Be	mg/L	15	0					
Mo	mg/L	15	7	0.0457	0.0400	0.0223	0.0800	0.0200
Ca	mg/L	25	25	363	17.7	477	1700	8.10
V	mg/L	16	8	0.624	0.0450	1.65	4.70	0.0300
Al	mg/L	15	15	0.449	0.400	0.217	0.800	0.160
Mg	mg/L	25	25	5.33	3.40	4.53	17.0	1.55

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-1

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Ni	mg/L	3	0					
Be	mg/L	3	0					
Mo	mg/L	3	0					
Ca	mg/L	5	5	18.5	16.7	7.81	32.0	12.0
V	mg/L	3	0					
Al	mg/L	3	3	0.207	0.200	0.0503	0.260	0.160
Mg	mg/L	5	5	3.88	3.30	1.55	6.60	2.80

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-2

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Ni	mg/L	3	0					
Be	mg/L	3	0					
Mo	mg/L	3	0					
Ca	mg/L	5	5	10.3	8.50	4.16	17.7	8.10
V	mg/L	3	0					
Al	mg/L	3	3	0.297	0.300	0.105	0.400	0.190
Mg	mg/L	5	5	2.43	2.10	0.883	4.00	1.90

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-3

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Ni	mg/L	3	0					
Be	mg/L	2	0					
Mo	mg/L	2	0					
Ca	mg/L	4	4	13.0	13.2	1.46	14.5	11.0
V	mg/L	2	0					
Al	mg/L	2	2	0.470			0.520	0.420
Mg	mg/L	4	4	3.20	3.30	0.356	3.50	2.70

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-4

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Ni	mg/L	3	3	0.0167	0.0200	0.0058	0.0200	0.0100
Be	mg/L	2	0					
Mo	mg/L	2	2	0.0300			0.0400	0.0200
Ca	mg/L	4	4	530	520	60.0	600	480
V	mg/L	2	2	0.0350			0.0400	0.0300
Al	mg/L	2	2	0.510			0.640	0.380
Mg	mg/L	4	4	13.8	14.6	3.89	17.0	8.80

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-5

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Ni	mg/L	3	3	0.0300	0.0300	0.0100	0.0400	0.0200
Be	mg/L	3	0					
Mo	mg/L	3	3	0.0667	0.0600	0.0115	0.0800	0.0600
Ca	mg/L	5	5	1154	1040	340	1700	850
V	mg/L	4	4	1.21	0.0500	2.32	4.70	0.0500
Al	mg/L	3	3	0.720	0.680	0.0693	0.800	0.680
Mg	mg/L	5	5	4.02	4.70	1.45	5.20	2.00

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-6

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Ni	mg/L	2	2	0.0150			0.0200	0.0100
Be	mg/L	2	0					
Mo	mg/L	2	2	0.0300			0.0400	0.0200
Ca	mg/L	2	2	495			560	430
V	mg/L	2	2	0.0350			0.0400	0.0300
Al	mg/L	2	2	0.550			0.760	0.340
Mg	mg/L	2	2	6.93			12.3	1.55

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station All outfalls considered

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Ba	mg/L	16	16	0.115	0.0700	0.148	0.600	0.0100
K	mg/L	24	24	32.0	3.30	42.1	125	0.600
St	mg/L	15	15	1.21	0.130	1.38	3.80	0.0400
Na	mg/L	25	25	30.7	9.00	31.9	105	3.00
Hg	ug/L	1	0					
As	ug/L	1	0					
Se	ug/L	1	0					

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-1

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Ba	mg/L	3	3	0.0150	0.0150	0.0050	0.0200	0.0100
K	mg/L	5	5	2.54	2.40	0.879	3.90	1.50
St	mg/L	3	3	0.0800	0.0600	0.0436	0.130	0.0500
Na	mg/L	5	5	6.30	5.50	2.71	11.0	4.00
Hg	ug/L	1	0					
As	ug/L	1	0					
Se	ug/L	1	0					

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-2

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Ba	mg/L	4	4	0.163	0.0200	0.292	0.600	0.0100
K	mg/L	4	4	0.913	0.750	0.431	1.55	0.600
St	mg/L	3	3	0.0500	0.0400	0.0173	0.0700	0.0400
Na	mg/L	5	5	4.80	4.00	2.39	9.00	3.00
Hg	ug/L	0	0					
As	ug/L	0	0					
Se	ug/L	0	0					

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-3

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Ba	mg/L	2	2	0.0200			0.0200	0.0200
K	mg/L	4	4	1.45	1.07	0.836	2.70	0.950
St	mg/L	2	2	0.0550			0.0600	0.0500
Na	mg/L	4	4	5.50	5.25	0.707	6.50	5.00
Hg	ug/L	0	0					
As	ug/L	0	0					
Se	ug/L	0	0					

Note: N-number of observations, ND-number detected

Summary of Water Quality Data for Station Algoma SW-4

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Ba	mg/L	2	2	0.155			0.160	0.150
K	mg/L	4	4	36.5	34.5	5.07	44.0	33.0
St	mg/L	2	2	2.00			2.10	1.91
Na	mg/L	4	4	83.2	85.0	20.1	105	58.0
Hg	ug/L	0	0					
As	ug/L	0	0					
Se	ug/L	0	0					

Note: N-number of observations, ND-number detected

Summary of Water Quality Data for Station Algoma SW-5

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Ba	mg/L	3	3	0.160	0.150	0.0458	0.210	0.120
K	mg/L	5	5	107	110	15.1	125	84.0
St	mg/L	3	3	3.33	3.20	0.416	3.80	3.00
Na	mg/L	5	5	54.0	55.0	7.48	65.0	47.0
Hg	ug/L	0	0					
As	ug/L	0	0					
Se	ug/L	0	0					

Note: N-number of observations, ND-number detected

Summary of Water Quality Data for Station Algoma SW-6

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Ba	mg/L	2	2	0.155			0.170	0.140
K	mg/L	2	2	34.0			36.0	32.0
St	mg/L	2	2	1.82			2.00	1.63
Na	mg/L	2	2	43.5			47.0	40.0
Hg	ug/L	0	0					
As	ug/L	0	0					
Se	ug/L	0	0					

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station All outfalls considered

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
PNNAPH	ug/L	16	10	95.9	20.5	164	500	0.0100
PNACNY	ug/L	16	6	6.89	2.95	8.47	18.0	0.130
PNACNY	ug/L	16	8	29.0	1.15	56.1	160	0.100
PNFLUO	ug/L	16	8	22.6	0.900	33.9	76.0	0.100
PNPHEN	ug/L	16	11	20.3	1.05	36.7	96.0	0.0300
PNANTH	ug/L	16	5	4.15	3.20	4.85	12.0	0.150
PNFLAN	ug/L	16	9	3.15	0.900	4.42	13.0	0.100
PNPYR	ug/L	16	9	2.00	0.600	2.97	9.10	0.100
PNBAA	ug/L	16	4	0.200	0.150	0.141	0.400	0.100

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-1

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
PNNAPH	ug/L	3	2	0.0600			0.100	0.0200
PNACNY	ug/L	3	0					
PNACNY	ug/L	3	0					
PNFLUO	ug/L	3	0					
PNPHEN	ug/L	3	1	0.0500			0.0500	0.0500
PNANTH	ug/L	3	0					
PNFLAN	ug/L	3	0					
PNPYR	ug/L	3	0					
PNBAA	ug/L	3	0					

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-2

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
PNNAPH	ug/L	3	2	0.0200			0.0300	0.0100
PNACNY	ug/L	3	0					
PNACNY	ug/L	3	0					
PNFLUO	ug/L	3	0					
PNPHEN	ug/L	3	1	0.0300			0.0300	0.0300
PNANTH	ug/L	3	0					
PNFLAN	ug/L	3	0					
PNPYR	ug/L	3	0					
PNBAA	ug/L	3	0					

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-3

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
PNNAPH	ug/L	2	0					
PNACNY	ug/L	2	0					
PNACNY	ug/L	2	0					
PNFLUO	ug/L	2	0					
PNPHEN	ug/L	2	1	0.200			0.200	0.200
PNANTH	ug/L	2	0					
PNFLAN	ug/L	2	1	0.200			0.200	0.200
PNPYR	ug/L	2	1	0.100			0.100	0.100
PNBAA	ug/L	2	1	0.100			0.100	0.100

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-4

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
PNNAPH	ug/L	2	2	289			500	78.0
PNACNY	ug/L	2	2	11.2			17.0	5.50
PNACNY	ug/L	2	2	34.2			54.0	14.4
PNFLUO	ug/L	2	2	51.0			75.0	27.0
PNPHEN	ug/L	2	2	60.5			87.0	34.0
PNANTH	ug/L	2	2	4.15			5.10	3.20
PNFLAN	ug/L	2	2	6.00			7.10	4.90
PNPYR	ug/L	2	2	3.25			4.10	2.40
PNBAA	ug/L	2	2	0.150			0.200	0.100

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-5

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
PNNAPH	ug/L	3	3	104	39.0	145	270	2.10
PNACNY	ug/L	3	3	0.277	0.300	0.137	0.400	0.130
PNACNY	ug/L	3	3	0.903	0.900	0.495	1.40	0.410
PNFLUO	ug/L	3	3	0.790	0.800	0.215	1.00	0.570
PNPHEN	ug/L	3	3	1.72	1.60	0.732	2.50	1.05
PNANTH	ug/L	3	2	0.225			0.300	0.150
PNFLAN	ug/L	3	3	0.717	0.700	0.176	0.900	0.550
PNPYR	ug/L	3	3	0.470	0.410	0.113	0.600	0.400
PNBAA	ug/L	3	0					

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-6

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
PNNAPH	ug/L	1	1	70.0			70.0	70.0
PNACNY	ug/L	1	1	18.0			18.0	18.0
PNACNY	ug/L	1	1	160			160	160
PNFLUO	ug/L	1	1	76.0			76.0	76.0
PNPHEN	ug/L	1	1	96.0			96.0	96.0
PNANTH	ug/L	1	1	12.0			12.0	12.0
PNFLAN	ug/L	1	1	13.0			13.0	13.0
PNPYR	ug/L	1	1	9.10			9.10	9.10
PNBAA	ug/L	1	1	0.400			0.400	0.400

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station All outfalls considered

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
PNCHRY	ug/L	16	3	0.200	0.100	0.173	0.400	0.100
PNBBFA	ug/L	15	1	0.100			0.100	0.100
PNBKF	ug/L	11	1	0.100			0.100	0.100
PNBAP	ug/L	15	1	0.200			0.200	0.200
PNPERY	ug/L	15	0					
PNINP	ug/L	15	0					
PNDAHA	ug/L	15	0					
PNGHIP	ug/L	15	0					
TPAH	ug/L	8	8	155	23.3	249	710	0.0100

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-1

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
PNCHRY	ug/L	3	0					
PNBBFA	ug/L	3	0					
PNBKF	ug/L	2	0					
PNBAP	ug/L	3	0					
PNPERY	ug/L	3	0					
PNINP	ug/L	3	0					
PNDAHA	ug/L	3	0					
PNGHIP	ug/L	3	0					
TPAH	ug/L	2	2	0.240			0.470	0.0100

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-2

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
PNCHRY	ug/L	3	0					
PNBBFA	ug/L	3	0					
PNBKF	ug/L	2	0					
PNBAP	ug/L	3	0					
PNPERY	ug/L	3	0					
PNINP	ug/L	3	0					
PNDAHA	ug/L	3	0					
PNGHIP	ug/L	3	0					
TPAH	ug/L	2	2	0.0350			0.0600	0.0100

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-3

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
PNCHRY	ug/L	2	0					
PNBBFA	ug/L	2	0					
PNBKF	ug/L	2	0					
PNBAP	ug/L	2	0					
PNPERY	ug/L	2	0					
PNINP	ug/L	2	0					
PNDAHA	ug/L	2	0					
PNGHIP	ug/L	2	0					
TPAH	ug/L	0	0					

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-4

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
PNCHRY	ug/L	2	2	0.100			0.100	0.100
PNBBFA	ug/L	2	0					
PNBKF	ug/L	1	0					
PNBAP	ug/L	2	0					
PNPERY	ug/L	2	0					
PNINP	ug/L	2	0					
PNDAHA	ug/L	2	0					
PNGHIP	ug/L	2	0					
TPAH	ug/L	2	2	460			710	209

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-5

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
PNCHRY	ug/L	3	0					
PNBBFA	ug/L	2	0					
PNBKF	ug/L	1	0					
PNBAP	ug/L	2	0					
PNPERY	ug/L	2	0					
PNINP	ug/L	2	0					
PNDAHA	ug/L	2	0					
PNGHIP	ug/L	2	0					
TPAH	ug/L	2	2	160			275	46.1

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-6

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
PNCHRY	ug/L	1	1	0.400			0.400	0.400
PNBBFA	ug/L	1	1	0.100			0.100	0.100
PNBKF	ug/L	1	1	0.100			0.100	0.100
PNBAP	ug/L	1	1	0.200			0.200	0.200
PNPERY	ug/L	1	0					
PNINP	ug/L	1	0					
PNDAHA	ug/L	1	0					
PNGHIP	ug/L	1	0					
TPAH	ug/L	0	0					

Note: N-number of observations, ND-number detected

Summary of Water Quality Data for Station All outfalls considered

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Benzene	ug/L	5	2	12.8			22.0	3.50
Toluene	ug/L	5	1	13.0			13.0	13.0
Xylenes	ug/L	5	2	16.5			30.0	3.00

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-1

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Benzene	ug/L	1	0					
Toluene	ug/L	1	0					
Xylenes	ug/L	1	0					

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-2

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Benzene	ug/L	1	0					
Toluene	ug/L	1	0					
Xylenes	ug/L	1	0					

Note: N=number of observations, ND=number detected

Summary of Water Quality Data for Station Algoma SW-3

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Benzene	ug/L	1	0					
Toluene	ug/L	1	0					
Xylenes	ug/L	1	0					

Note: N-number of observations, ND-number detected

Summary of Water Quality Data for Station Algoma SW-4

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Benzene	ug/L	1	1	22.0			22.0	22.0
Toluene	ug/L	1	1	13.0			13.0	13.0
Xylenes	ug/L	1	1	30.0			30.0	30.0

Note: N-number of observations, ND-number detected

Summary of Water Quality Data for Station Algoma SW-5

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Benzene	ug/L	1	1	3.50			3.50	3.50
Toluene	ug/L	1	0					
Xylenes	ug/L	1	1	3.00			3.00	3.00

Note: N-number of observations, ND-number detected

Summary of Water Quality Data for Station Algoma SW-6

Parameter	Units	N	ND	Mean	Median	Std.Dev.	Maximum	Minimum
Benzene	ug/L	0	0					
Toluene	ug/L	0	0					
Xylenes	ug/L	0	0					

Note: N=number of observations, ND=number detected

APPENDIX 13

SURFACE WATER LOADING DATA

[redacted]

SUMMARY OUTPUT FROM LOADS V2.5 July 1990

Run 1: Concentration file: algo2b.dat
Analysis for outfall(s): Algoma SW-1
Discharge file: algo.flo
Number: 1
Mean flow (QBAR): 58400000. L/d Std: 92600000. Skew: 1.88 Kurt: 6.52 Flow points: 12 (LogStd or TStd: 1.996)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
Cl	6	6	mg/L	10.400	4.578	1.129	6.843	6.000	18.200	2.268	0.414	0.591	5.575
F	6	6	mg/L	0.070	0.025	2.112	11.006	0.050	0.120	-2.703	0.305	1.787	9.994
SO4	6	6	mg/L	28.167	13.136	1.264	7.195	16.000	51.000	3.257	0.430	0.730	5.831
NH4-N	1	1	mg/L	0.500	0.000	0.000	0.000	0.500	0.500	-0.693	0.000	0.000	0.000
NO3-N	6	6	mg/L	0.188	0.157	1.618	9.031	0.040	0.480	-1.946	0.832	-0.088	7.117
TkN	6	6	mg/L	0.486	0.144	0.554	5.667	0.320	0.710	-0.758	0.295	0.145	5.065
TP	6	6	mg/L	0.009	0.004	1.328	7.695	0.006	0.015	-4.811	0.376	0.862	5.885
DOC	7	7	mg/L	6.636	1.431	1.673	7.897	5.500	9.500	1.875	0.196	1.449	6.946
Phnol	7	1	mg/L	0.006	0.000	0.000	0.000	0.006	0.006	-5.116	0.000	0.000	0.000

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	TStd	Trans	Regression Estimates Mean	TStd	R**2
Cl	6	6	mg/L	0.010	10.400	10.400	10.400	LN	10.500	0.171	LN	10.500	0.414	0.971
F	6	6	mg/L	0.010	0.070	0.070	0.070	LN	0.070	0.093	LN	0.070	0.305	0.722
SO4	6	6	mg/L	0.050	28.200	28.200	28.200	LN	28.500	0.185	LN	28.500	0.430	0.951
NH4-N	1	1	mg/L	0.050	0.500	0.500	0.500	N/A	0.000	0.000	N/A	0.000	0.000	0.000
NO3-N	6	6	mg/L	0.010	0.190	0.190	0.190	LN	0.200	0.692	LN	0.200	0.832	0.920
TkN	6	6	mg/L	0.050	0.490	0.490	0.490	LN	0.490	0.087	LN	0.490	0.295	0.958
TP	6	6	mg/L	0.001	0.009	0.009	0.009	LN	0.009	0.141	LN	0.009	0.376	0.861
DOC	7	7	mg/L	0.500	6.640	6.640	6.640	LN	6.650	0.038	LN	6.650	0.196	0.812
Phnol	7	1	mg/L	0.001	0.002	0.001	0.001	N/A	0.000	0.000	N/A	0.000	0.000	0.000

Loading Estimates: Load=QBAR*CBAR

Parameter Code	N	ND	Units	Instantaneous Loadings Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	X	Trans	Regression Estimates Mean	X
Cl	0	0	kg/d	0.000	0.000	607.000	607.000	607.000	LN	613.000	0.581	LN	613.000	0.601
F	0	0	kg/d	0.000	0.000	4.090	4.090	4.090	LN	4.090	0.578	LN	4.090	0.590
SO4	0	0	kg/d	0.000	0.000	1650.000	1650.000	1650.000	LN	1660.000	0.581	LN	1660.000	0.602
NH4-N	0	0	kg/d	0.000	0.000	29.200	29.200	29.200	N/A	0.000	0.000	N/A	0.000	0.000
NO3-N	0	0	kg/d	0.000	0.000	11.100	11.100	11.100	LN	11.700	0.642	LN	11.700	0.669
TkN	0	0	kg/d	0.000	0.000	28.600	28.600	28.600	LN	28.600	0.577	LN	28.600	0.589
TP	0	0	g/d	0.000	0.000	508.000	508.000	508.000	LN	508.000	0.579	LN	508.000	0.596
DOC	0	0	kg/d	0.000	0.000	388.000	388.000	388.000	LN	388.000	0.576	LN	388.000	0.581
Phnol	0	0	g/d	0.000	0.000	99.300	75.900	50.200	N/A	0.000	0.000	N/A	0.000	0.000

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Concentration Estimates Units	Mean	Confidence Interval		Loading Estimates Units	Mean	Confidence Interval	
Cl	mg/L	10.500	9.160	12.000	kg/d	613.00	196.00	1910.00
F	mg/L	0.070	0.065	0.075	kg/d	4.09	1.32	12.70
SO4	mg/L	28.500	24.600	33.000	kg/d	1660.00	531.00	5190.00
NH4-N	mg/L	0.500#			kg/d	29.20#		
NO3-N	mg/L	0.200	0.120	0.350	kg/d	11.70	3.33	41.20
TkN	mg/L	0.490	0.460	0.530	kg/d	28.60	9.22	88.70
TP	mg/L	0.009	0.008	0.010	g/d	508.00	163.00	1580.00
DOC	mg/L	6.650	6.460	6.840	kg/d	388.00	125.00	1200.00
Phnol	mg/L	0.001#			g/d	75.90#		

NOTE: * Regression estimate used, # Weighted Ave. method used with Cu=0.5DL

SUMMARY OUTPUT FROM LOADS V2.5 July 1990

Run 2: Concentration file: algo2b.dat
Analysis for outfall(s): Algoma SW-2
Mean flow (QBAR): 58400000. L/d Std: 92600000. Skew: 1.88

Discharge file: algo.flo
Number: 1
Kurt: 6.52 Flow points: 12 (LogStd or TStd: 1.996)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
Cl	6	6	mg/L	7.792	3.698	1.012	5.895	4.500	13.800	1.966	0.448	0.627	4.874
F	6	6	mg/L	0.042	0.028	-0.150	5.633	0.003	0.080	-3.546	1.204	-1.718	9.251
SO4	6	6	mg/L	9.058	1.896	-1.000	7.928	5.750	11.200	2.183	0.234	-1.468	9.110
NH4-N	0	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NO3-N	6	6	mg/L	0.182	0.145	1.893	9.974	0.070	0.460	-1.915	0.673	0.965	7.050
TkN	6	6	mg/L	0.293	0.041	1.651	9.337	0.260	0.370	-1.234	0.131	1.452	8.689
TP	5	5	mg/L	0.010	0.004	0.459	9.934	0.004	0.016	-4.737	0.499	-0.884	10.287
DOC	7	7	mg/L	6.429	1.466	0.933	5.304	5.000	9.000	1.840	0.218	0.679	4.557
Phnol	7	1	mg/L	0.003	0.000	0.000	0.000	0.003	0.003	-5.809	0.000	0.000	0.000

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	TStd	Trans	Regression Estimates Mean	TStd	R**2
Cl	6	6	mg/L	0.010	7.790	7.790	7.790	LN	7.900	0.201	LN	7.900	0.448	0.947
F	6	6	mg/L	0.010	0.042	0.042	0.042	LN	0.060	1.449	LN	0.060	1.204	0.784
SO4	6	6	mg/L	0.050	9.060	9.060	9.060	LN	9.120	0.055	N/A	0.000	0.000	0.000
NO3-N	6	6	mg/L	0.010	0.180	0.180	0.180	LN	0.180	0.453	LN	0.180	0.673	0.926
TkN	6	6	mg/L	0.050	0.290	0.290	0.290	LN	0.290	0.017	N/A	0.000	0.000	0.000
TP	5	5	mg/L	0.001	0.010	0.010	0.010	LN	0.010	0.249	LN	0.010	0.499	0.831
DOC	7	7	mg/L	0.500	6.430	6.430	6.430	LN	6.450	0.047	LN	6.450	0.218	0.941
Phnol	7	1	mg/L	0.001	0.001	0.001	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000

Loading Estimates: Load=QBAR*CBAR

Parameter Code	Instantaneous Loadings N	ND	Units	Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	X	Regression Estimates Trans	Mean	X
Cl	0	0	kg/d	0.000	0.000	455.000	455.000	455.000	LN	461.000	0.582	LN	461.000	0.605
F	0	0	kg/d	0.000	0.000	2.450	2.450	2.450	LN	3.500	0.826	LN	3.500	0.757
SO4	0	0	kg/d	0.000	0.000	529.000	529.000	529.000	LN	533.000	0.577	N/A	0.000	0.000
NO3-N	0	0	kg/d	0.000	0.000	10.500	10.500	10.500	LN	10.500	0.605	LN	10.500	0.638
TkN	0	0	kg/d	0.000	0.000	16.900	16.900	16.900	LN	16.900	0.576	N/A	0.000	0.000
TP	0	0	g/d	0.000	0.000	561.000	561.000	561.000	LN	578.000	0.587	LN	578.000	0.618
DOC	0	0	kg/d	0.000	0.000	376.000	376.000	376.000	LN	377.000	0.577	LN	377.000	0.582
Phnol	0	0	g/d	0.000	0.000	75.900	50.200	25.100	N/A	0.000	0.000	N/A	0.000	0.000

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Units	Concentration Estimates Mean	Confidence Interval		Units	Loading Estimates Mean	Confidence Interval	
Cl	mg/L	7.900	6.730	9.280	kg/d	461.00	147.00	1440.00
F	mg/L	0.060	0.019	0.190	kg/d	3.50	0.69	17.70
SO4	mg/L	9.120	8.730	9.530	kg/d	533.00	172.00	1650.00
NH4-N	mg/L	NC			mg/d	NC		
NO3-N	mg/L	0.180	0.130	0.260	kg/d	10.50	3.21	34.40
TkN	mg/L	0.290	0.290	0.290	kg/d	16.90	5.46	52.30
TP	mg/L	0.010	0.008	0.012	g/d	578.00	183.00	1830.00
DOC	mg/L	6.450	6.230	6.680	kg/d	377.00	122.00	1170.00
Phnol	mg/L	0.001#			g/d	50.20#		

NOTE: * Regression estimate used, # Weighted Ave. method used with Cu=0.5DL

SUMMARY OUTPUT FROM LOADS V2.5 July 1990

Run 3: Concentration file: algo2b.dat
Analysis for outfall(s): Algoma SW-3
Discharge file: algo.flo
Number: 1
Mean flow (QBAR): 26300000. L/d Std: 20400000. Skew: 1.32 Kurt: 4.71 Flow points: 12 (LogStd or TStd: 0.795)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
Cl	5	5	mg/L	14.080	3.652	0.987	9.419	10.100	19.800	2.619	0.251	0.486	8.637
F	5	5	mg/L	0.065	0.017	-0.782	6.979	0.040	0.080	-2.766	0.296	-1.068	8.029
SO4	5	5	mg/L	12.330	1.627	-0.817	6.723	10.000	13.800	2.505	0.137	-0.925	7.126
NH4-N	0	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NO3-N	5	5	mg/L	0.314	0.183	-0.480	8.787	0.045	0.540	-1.421	0.977	-1.818	11.644
TkN	4	4	mg/L	0.270	0.037	-0.764	15.000	0.220	0.310	-1.317	0.144	-1.005	15.297
TP	4	4	mg/L	0.013	0.010	1.277	14.545	0.004	0.027	-4.648	0.846	0.409	11.640
DOC	6	6	mg/L	5.017	1.123	1.261	7.640	4.000	7.000	1.594	0.210	0.949	6.655
Phnol	6	4	mg/L	0.002	0.002	0.370	9.599	0.001	0.004	-6.287	0.727	0.134	8.268

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	TStd	Trans	Regression Estimates Mean	TStd	R**2
Cl	5	5	mg/L	0.010	14.100	14.100	14.100	LN	14.200	0.063	LN	14.200	0.251	0.956
F	5	5	mg/L	0.010	0.065	0.065	0.065	LN	0.066	0.088	LN	0.066	0.296	0.886
SO4	5	5	mg/L	0.050	12.300	12.300	12.300	LN	12.400	0.019	LN	12.400	0.137	0.902
NO3-N	5	5	mg/L	0.010	0.310	0.310	0.310	LN	0.390	0.954	LN	0.390	0.977	0.756
TkN	4	4	mg/L	0.050	0.270	0.270	0.270	LN	0.270	0.021	LN	0.270	0.144	0.913
TP	4	4	mg/L	0.001	0.012	0.012	0.012	LN	0.014	0.716	LN	0.014	0.846	0.984
DOC	6	6	mg/L	0.500	5.020	5.020	5.020	LN	5.030	0.044	LN	5.030	0.210	0.926
Phnol	6	4	mg/L	0.001	0.002	0.002	0.002	LN	0.002	0.790	LN	0.002	1.004	0.872

Loading Estimates: Load=QBAR*CBAR

Parameter Code	N	ND	Units	Instantaneous Loadings Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	X	Trans	Regression Estimates Mean	X
Cl	0	0	kg/d	0.000	0.000	371.000	371.000	371.000	LN	373.000	0.231	LN	373.000	0.255
F	0	0	kg/d	0.000	0.000	1.710	1.710	1.710	LN	1.740	0.233	LN	1.740	0.265
SO4	0	0	kg/d	0.000	0.000	323.000	323.000	323.000	LN	326.000	0.230	LN	326.000	0.237
NO3-N	0	0	kg/d	0.000	0.000	8.150	8.150	8.150	LN	10.300	0.484	LN	10.300	0.493
TkN	0	0	kg/d	0.000	0.000	7.100	7.100	7.100	LN	7.100	0.230	LN	7.100	0.240
TP	0	0	g/d	0.000	0.000	316.000	316.000	316.000	LN	368.000	0.425	LN	368.000	0.481
DOC	0	0	kg/d	0.000	0.000	132.000	132.000	132.000	LN	132.000	0.230	LN	132.000	0.245
Phnol	0	0	g/d	0.000	0.000	47.300	44.700	39.500	LN	47.300	0.396	LN	47.300	0.470

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Concentration Estimates Units	Mean	Confidence Interval		Loading Estimates Units	Mean	Confidence Interval	
Cl	mg/L	14.200	13.400	15.000	kg/d	373.00	237.00	587.00
F	mg/L	0.066	0.061	0.071	kg/d	1.74	1.10	2.75
SO4	mg/L	12.400	12.200	12.600	kg/d	326.00	208.00	511.00
NH4-N	mg/L	NC			mg/d	NC		
NO3-N	mg/L	0.390	0.170	0.900	kg/d	10.30	3.99	26.60
TkN	mg/L	0.270	0.260	0.280	kg/d	7.10	4.53	11.10
TP	mg/L	0.014	0.007	0.028	g/d	368.00	160.00	847.00
DOC	mg/L	5.030	4.860	5.210	kg/d	132.00	84.10	207.00
Phnol	mg/L	0.002	0.001	0.003	g/d	47.30	21.80	103.00

NOTE: * Regression estimate used, # Weighted Ave. method used with Cu=0.5DL

SUMMARY OUTPUT FROM LOADS V2.5 July 1990

Run 4: Concentration file: algo2b.dat
Discharge file: algo.flo
Number: 1
Analysis for outfall(s): Algoma SW-4
Mean flow (QBAR): 88600. L/d Std: 105000. Skew: 1.42 Kurt: 6.51 Flow points: 8 (LogStd or TStd: 1.730)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
Cl	6	6	mg/L	1092.500	436.437	-1.708	9.374	270.000	1460.000	6.872	0.639	-2.203	11.271
F	6	5	mg/L	1.010	0.160	0.467	10.116	0.800	1.250	0.000	0.158	0.000	10.000
SO4	6	6	mg/L	216.333	44.428	-0.032	4.362	166.000	270.000	5.359	0.210	-0.219	4.334
NH4-N	0	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NO3-N	6	3	mg/L	0.183	0.076	-0.935	0.000	0.100	0.250	-1.766	0.478	-1.317	0.000
TkN	5	5	mg/L	2.202	0.728	2.204	12.886	1.800	3.500	0.754	0.280	2.173	12.781
TP	5	5	mg/L	0.023	0.037	2.170	12.753	0.002	0.088	-4.680	1.423	1.084	9.557
DOC	7	7	mg/L	6.229	0.591	2.162	10.218	5.800	7.500	1.826	0.089	2.080	9.856
Phnol	7	7	mg/L	0.256	0.247	1.124	6.667	0.034	0.720	-1.909	1.239	-0.191	3.309

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	TStd	Trans	Regression Estimates Mean	TStd	R**2
Cl	6	6	mg/L	0.010	1090.000	1090.000	1090.000	LN	1180.000	0.409	LN	1180.000	0.639	0.639
F	6	5	mg/L	0.010	0.840	0.840	0.840	N/A	0.000	0.000	LN	0.970	0.179	0.800
SO4	6	6	mg/L	0.050	216.000	216.000	216.000	LN	217.000	0.044	LN	217.000	0.210	0.950
NO3-N	6	3	mg/L	0.010	0.097	0.094	0.092	N/A	0.000	0.000	N/A	0.000	0.000	0.000
TkN	5	5	mg/L	0.050	2.200	2.200	2.200	LN	2.210	0.079	LN	2.210	0.280	0.599
TP	5	5	mg/L	0.001	0.023	0.023	0.023	LN	0.026	2.025	LN	0.026	1.423	0.897
DOC	7	7	mg/L	0.500	6.230	6.230	6.230	LN	6.230	0.008	LN	6.230	0.089	0.657
Phnol	7	7	mg/L	0.001	0.260	0.260	0.260	LN	0.320	1.535	LN	0.320	1.239	0.920

Loading Estimates: Load=QBAR*CBAR

Parameter Code	N	ND	Units	Instantaneous Loadings Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	X	Trans	Regression Estimates Mean	X
Cl	0	0	kg/d	0.000	0.000	96.600	96.600	96.600	LN	105.000	0.634	LN	105.000	0.665
F	0	0	g/d	0.000	0.000	74.400	74.400	74.400	N/A	0.000	0.000	LN	85.900	0.616
SO4	0	0	kg/d	0.000	0.000	19.100	19.100	19.100	LN	19.200	0.612	LN	19.200	0.618
NO3-N	0	0	g/d	0.000	0.000	8.590	8.330	8.150	N/A	0.000	0.000	N/A	0.000	0.000
TkN	0	0	g/d	0.000	0.000	195.000	195.000	195.000	LN	196.000	0.613	LN	196.000	0.624
TP	0	0	g/d	0.000	0.000	2.040	2.040	2.040	LN	2.300	1.093	LN	2.300	0.883
DOC	0	0	g/d	0.000	0.000	552.000	552.000	552.000	LN	552.000	0.612	LN	552.000	0.613
Phnol	0	0	g/d	0.000	0.000	23.000	23.000	23.000	LN	28.400	0.843	LN	28.400	0.770

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Concentration Estimates Units	Mean	Confidence Interval		Loading Estimates Units	Mean	Confidence Interval	
Cl	mg/L	1180.000	851.000	1640.000	kg/d	105.00	30.30	364.00
F	mg/L	0.970*	0.840	1.120	g/d	85.90*	25.70	287.00
SO4	mg/L	217.000	209.000	225.000	kg/d	19.20	5.79	63.70
NH4-N	mg/L	NC			mg/d	NC		
NO3-N	mg/L	0.094#			g/d	8.33#		
TkN	mg/L	2.210	2.060	2.370	g/d	196.00	59.00	651.00
TP	mg/L	0.026	0.004	0.150	g/d	2.30	0.27	19.60
DOC	mg/L	6.230	6.190	6.270	g/d	552.00	166.00	1830.00
Phnol	mg/L	0.320	0.100	1.000	g/d	28.40	5.44	148.00

NOTE: * Regression estimate used, # Weighted Ave. method used with Cu=0.5DL

SUMMARY OUTPUT FROM LOADS V2.5 July 1990

Run 5: Concentration file: algo2b.dat
Discharge file: algo.flo
Number: 1
Analysis for outfall(s): Algoma SW-5
Mean flow (QBAR): 339000. L/d Std: 144000. Skew: -1.33 Kurt: 10.23 Flow points: 5 (LogStd or TStd: 0.614)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
Cl	6	6	mg/L	2028.333	1103.312	1.727	9.150	1210.000	4100.000	7.515	0.467	1.167	7.101
F	6	3	mg/L	1.033	0.058	1.732	0.000	1.000	1.100	0.032	0.055	1.732	0.000
SO4	6	6	mg/L	565.000	55.767	-0.327	6.289	480.000	640.000	6.333	0.100	-0.531	6.477
NH4-N	0	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NO3-N	6	3	mg/L	0.350	0.218	1.630	0.000	0.200	0.600	-1.169	0.581	1.449	0.000
TkN	6	6	mg/L	3.658	1.313	0.648	6.628	2.200	5.800	1.243	0.361	0.003	5.448
TP	5	5	mg/L	0.006	0.004	-0.269	5.658	0.001	0.011	-5.359	1.006	-1.107	8.134
DOC	7	7	mg/L	11.257	3.307	0.815	5.590	7.500	17.000	2.386	0.285	0.324	4.887
Phnol	7	7	mg/L	0.031	0.016	0.347	3.298	0.013	0.052	-3.611	0.567	-0.029	3.452

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	TStd	Trans	Regression Estimates Mean	TStd	R**2
Cl	6	6	mg/L	0.010	2030.000	2030.000	2030.000	LN	2050.000	0.218	LN	2050.000	0.467	0.867
F	6	3	mg/L	0.010	0.520	0.520	0.520	N/A	0.000	0.000	LN	0.970	0.091	0.750
SO4	6	6	mg/L	0.050	565.000	565.000	565.000	LN	566.000	0.010	LN	566.000	0.100	0.964
NO3-N	6	3	mg/L	0.010	0.180	0.180	0.180	N/A	0.000	0.000	LN	0.230	1.035	0.895
TkN	6	6	mg/L	0.050	3.660	3.660	3.660	LN	3.700	0.131	LN	3.700	0.361	0.952
TP	5	5	mg/L	0.001	0.006	0.006	0.006	LN	0.008	1.012	N/A	0.000	0.000	0.000
DOC	7	7	mg/L	0.500	11.300	11.300	11.300	LN	11.300	0.081	LN	11.300	0.285	0.962
Phnol	7	7	mg/L	0.001	0.031	0.031	0.031	LN	0.032	0.322	N/A	0.000	0.000	0.000

Loading Estimates: Load=QBAR*CBAR

Parameter Code	Instantaneous Loadings N	ND	Units	Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	X	Trans	Regression Estimates Mean	X
Cl	0	0	kg/d	0.000	0.000	688.000	688.000	688.000	LN	695.000	0.289	LN	695.000	0.334
F	0	0	g/d	0.000	0.000	176.000	176.000	176.000	N/A	0.000	0.000	LN	329.000	0.277
SO4	0	0	kg/d	0.000	0.000	192.000	192.000	192.000	LN	192.000	0.275	LN	192.000	0.278
NO3-N	0	0	g/d	0.000	0.000	61.000	61.000	61.000	N/A	0.000	0.000	LN	78.000	0.504
TkN	0	0	kg/d	0.000	0.000	1.240	1.240	1.240	LN	1.250	0.280	LN	1.250	0.312
TP	0	0	g/d	0.000	0.000	2.170	2.170	2.170	LN	2.640	0.529	N/A	0.000	0.000
DOC	0	0	kg/d	0.000	0.000	3.830	3.830	3.830	LN	3.830	0.276	LN	3.830	0.295
Phnol	0	0	g/d	0.000	0.000	10.500	10.500	10.500	LN	10.800	0.300	N/A	0.000	0.000

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Concentration Estimates Units	Mean	Confidence Interval		Loading Estimates Units	Mean	Confidence Interval	
Cl	mg/L	2050.000	1720.000	2440.000	kg/d	695.00	395.00	1220.00
F	mg/L	0.970*	0.900	1.040	g/d	329.00*	191.00	566.00
SO4	mg/L	566.000	561.000	571.000	kg/d	192.00	112.00	329.00
NH4-N	mg/L	NC			mg/d	NC		
NO3-N	mg/L	0.230*	0.100	0.530	g/d	78.00*	29.10	209.00
TkN	mg/L	3.700	3.330	4.110	kg/d	1.25	0.72	2.16
TP	mg/L	0.008	0.003	0.019	g/d	2.64	0.94	7.45
DOC	mg/L	11.300	10.600	12.000	kg/d	3.83	2.23	6.58
Phnol	mg/L	0.032	0.025	0.041	g/d	10.80	5.99	19.50

NOTE: * Regression estimate used, # Weighted Ave. method used with Cu=0.5DL

SUMMARY OUTPUT FROM LOADS V2.5 July 1990

Run 1: Concentration file: algo3.dat Discharge file: algo.flo
Analysis for outfall(s): Algoma SW-1 Number: 1
Mean flow (QBAR): 58400000. L/d Std: 92600000. Skew: 1.88 Kurt: 6.52 Flow points: 12 (LogStd or TStd: 1.996)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
Zn	3	1	mg/L	0.020	0.000	0.000	0.000	0.020	0.020	-3.912	0.000	0.000	0.000
Cd	3	1	mg/L	0.001	0.000	0.000	0.000	0.001	0.001	-6.908	0.000	0.000	0.000
Mn	3	3	mg/L	0.113	0.101	1.713	0.000	0.050	0.230	-2.426	0.833	1.639	0.000
Co	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cu	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Fe	3	3	mg/L	1.567	1.349	1.489	0.000	0.560	3.100	0.197	0.866	0.792	0.000
Pb	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cr	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	MLE Estimates Trans	Mean	TStd	Regression Estimates Trans	Mean	TStd	R**2
Zn	3	1	mg/L	0.010	0.013	0.010	0.007	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Cd	3	1	mg/L	0.005	0.004	0.002	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Mn	3	3	mg/L	0.010	0.110	0.110	0.110	LN	0.130	0.695	LN	0.130	0.833	0.838
Co	3	0	mg/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Cu	3	0	mg/L	0.005	0.005	0.002	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Fe	3	3	mg/L	0.020	1.570	1.570	1.570	LN	1.770	0.751	LN	1.770	0.866	0.975
Pb	3	0	mg/L	0.050	0.050	0.025	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Cr	3	0	mg/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000

Loading Estimates: Load=QBAR*CBAR

Parameter Code	N	ND	Instantaneous Loadings Units	Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	MLE Estimates Trans	Mean	X	Regression Estimates Trans	Mean	X
Zn	0	0	g/d	0.000	0.000	759.000	584.000	391.000	N/A	0.000	0.000	N/A	0.000	0.000
Cd	0	0	g/d	0.000	0.000	216.000	117.000	19.300	N/A	0.000	0.000	N/A	0.000	0.000
Mn	0	0	kg/d	0.000	0.000	6.420	6.420	6.420	LN	7.590	0.702	LN	7.590	0.751
Co	0	0	g/d	0.000	0.000	584.000	292.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Cu	0	0	g/d	0.000	0.000	292.000	146.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Fe	0	0	kg/d	0.000	0.000	91.700	91.700	91.700	LN	103.000	0.721	LN	103.000	0.763
Pb	0	0	kg/d	0.000	0.000	2.920	1.460	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Cr	0	0	g/d	0.000	0.000	584.000	292.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Concentration Estimates Units	Mean	Confidence Interval		Loading Estimates Units	Mean	Confidence Interval	
Zn	mg/L	0.010#			g/d	584.00#		
Cd	mg/L	0.002#			g/d	117.00#		
Mn	mg/L	0.130	0.059	0.290	kg/d	7.59	1.92	30.10
Co	mg/L	NC			g/d	NC		
Cu	mg/L	NC			g/d	NC		
Fe	mg/L	1.770	0.760	4.140	kg/d	103.00	25.10	423.00
Pb	mg/L	NC			kg/d	NC		
Cr	mg/L	NC			g/d	NC		

NOTE: * Regression estimate used, # Weighted Ave. method used with Cu=0.5DL

SUMMARY OUTPUT FROM LOADS V2.5 July 1990

Run 2: Concentration file: algo3.dat
Analysis for outfall(s): Algoma SW-2
Discharge file: algo.flo
Number: 1
Mean flow (QBAR): 58400000. L/d Std: 92600000. Skew: 1.88 Kurt: 6.52 Flow points: 12 (LogStd or TStd: 1.996)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
Zn	3	3	mg/L	0.013	0.006	1.732	0.000	0.010	0.020	-4.374	0.400	1.732	0.000
Cd	3	1	mg/L	0.001	0.000	0.000	0.000	0.001	0.001	-6.908	0.000	0.000	0.000
Mn	3	3	mg/L	0.050	0.026	1.458	0.000	0.030	0.080	-3.084	0.504	1.120	0.000
Co	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cu	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Fe	3	3	mg/L	0.520	0.106	-1.458	0.000	0.400	0.600	-0.669	0.217	-1.537	0.000
Pb	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cr	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	TStd	Trans	Regression Estimates Mean	TStd	R**2
Zn	3	3	mg/L	0.010	0.013	0.013	0.013	LN	0.014	0.160	LN	0.014	0.400	0.750
Cd	3	1	mg/L	0.005	0.004	0.002	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Mn	3	3	mg/L	0.010	0.050	0.050	0.050	LN	0.052	0.254	N/A	0.000	0.000	0.000
Co	3	0	mg/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Cu	3	0	mg/L	0.005	0.005	0.002	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Fe	3	3	mg/L	0.020	0.520	0.520	0.520	LN	0.520	0.047	N/A	0.000	0.000	0.000
Pb	3	0	mg/L	0.050	0.050	0.025	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Cr	3	0	mg/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000

Loading Estimates: Load=QBAR*CBAR

Parameter Code	N	ND	Units	Instantaneous Loadings Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	X	Trans	Regression Estimates Mean	X
Zn	0	0	g/d	0.000	0.000	759.000	759.000	759.000	LN	818.000	0.584	LN	818.000	0.621
Cd	0	0	g/d	0.000	0.000	216.000	117.000	19.300	N/A	0.000	0.000	N/A	0.000	0.000
Mn	0	0	kg/d	0.000	0.000	2.920	2.920	2.920	LN	3.040	0.595	N/A	0.000	0.000
Co	0	0	g/d	0.000	0.000	584.000	292.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Cu	0	0	g/d	0.000	0.000	292.000	146.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Fe	0	0	kg/d	0.000	0.000	30.400	30.400	30.400	LN	30.400	0.577	N/A	0.000	0.000
Pb	0	0	kg/d	0.000	0.000	2.920	1.460	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Cr	0	0	g/d	0.000	0.000	584.000	292.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Concentration Estimates Units	Mean	Confidence Interval		Loading Estimates Units	Mean	Confidence Interval	
Zn	mg/L	0.014	0.012	0.017	g/d	818.00	261.00	2570.00
Cd	mg/L	0.002#			g/d	117.00#		
Mn	mg/L	0.052	0.039	0.069	kg/d	3.04	0.95	9.75
Co	mg/L	NC			g/d	NC		
Cu	mg/L	NC			g/d	NC		
Fe	mg/L	0.520	0.490	0.550	kg/d	30.40	9.81	94.20
Pb	mg/L	NC			kg/d	NC		
Cr	mg/L	NC			g/d	NC		

NOTE: * Regression estimate used, # Weighted Ave. method used with Cu=0.5DL

SUMMARY OUTPUT FROM LOADS V2.5 July 1990

Run 3: Concentration file: algo3.dat
Analysis for outfall(s): Algoma SW-3
Discharge file: algo.flo
Number: 1
Mean flow (QBAR): 26300000. L/d Std: 20400000. Skew: 1.32 Kurt: 4.71 Flow points: 12 (LogStd or TStd: 0.795)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
Zn	3	3	mg/L	0.035	0.009	-1.732	0.000	0.025	0.040	-3.376	0.271	-1.732	0.000
Cd	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mn	3	3	mg/L	0.077	0.015	-0.935	0.000	0.060	0.090	-2.582	0.209	-1.132	0.000
Co	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cu	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Fe	3	3	mg/L	0.717	0.251	0.473	0.000	0.480	0.980	-0.375	0.357	-0.051	0.000
Pb	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cr	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	MLE Estimates Trans	Mean	TStd	Regression Estimates Trans	Mean	TStd	R**2
Zn	3	3	mg/L	0.010	0.035	0.035	0.035	LN	0.035	0.074	LN	0.035	0.271	0.750
Cd	3	0	mg/L	0.005	0.005	0.002	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Mn	3	3	mg/L	0.010	0.077	0.077	0.077	LN	0.077	0.044	LN	0.077	0.209	0.945
Co	3	0	mg/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Cu	3	0	mg/L	0.005	0.005	0.002	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Fe	3	3	mg/L	0.020	0.720	0.720	0.720	LN	0.730	0.127	LN	0.730	0.357	1.000
Pb	3	0	mg/L	0.050	0.050	0.025	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Cr	3	0	mg/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000

Loading Estimates: Load=QBAR*CBAR

Parameter Code	Instantaneous Loadings N	ND	Units	Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	MLE Estimates Trans	Mean	X	Regression Estimates Trans	Mean	X
Zn	0	0	g/d	0.000	0.000	921.000	921.000	921.000	LN	921.000	0.233	LN	921.000	0.278
Cd	0	0	g/d	0.000	0.000	132.000	65.800	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Mn	0	0	kg/d	0.000	0.000	2.030	2.030	2.030	LN	2.030	0.231	LN	2.030	0.259
Co	0	0	g/d	0.000	0.000	263.000	132.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Cu	0	0	g/d	0.000	0.000	132.000	65.800	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Fe	0	0	kg/d	0.000	0.000	18.900	18.900	18.900	LN	19.200	0.241	LN	19.200	0.308
Pb	0	0	kg/d	0.000	0.000	1.320	0.660	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Cr	0	0	g/d	0.000	0.000	263.000	132.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Concentration Estimates Units	Mean	Confidence Interval		Loading Estimates Units	Mean	Confidence Interval	
Zn	mg/L	0.035	0.032	0.038	g/d	921.00	583.00	1450.00
Cd	mg/L	NC			g/d	NC		
Mn	mg/L	0.077	0.073	0.081	kg/d	2.03	1.29	3.19
Co	mg/L	NC			g/d	NC		
Cu	mg/L	NC			g/d	NC		
Fe	mg/L	0.730	0.630	0.840	kg/d	19.20	12.00	30.80
Pb	mg/L	NC			kg/d	NC		
Cr	mg/L	NC			g/d	NC		

NOTE: * Regression estimate used, f Weighted Ave. method used with Cu=0.5DL

SUMMARY OUTPUT FROM LOADS V2.5 July 1990

Run 4: Concentration file: algo3.dat
Analysis for outfall(s): Algoma SW-4
Mean flow (QBAR): 88600. L/d Std: 105000. Skew: 1.42

Discharge file: algo.flo
Number: 1
Kurt: 6.51 Flow points: 8 (LogStd or TStd: 1.730)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
Zn	3	2	mg/L	0.020	0.000	0.000	0.000	0.020	0.020	-3.912	0.000	0.000	0.000
Cd	3	1	mg/L	0.001	0.000	0.000	0.000	0.001	0.001	-6.908	0.000	0.000	0.000
Mn	3	3	mg/L	0.897	0.630	-1.724	0.000	0.170	1.280	-0.437	1.157	-1.731	0.000
Co	3	2	mg/L	0.030	0.000	0.000	0.000	0.030	0.030	-3.507	0.000	0.000	0.000
Cu	3	2	mg/L	0.007	0.000	0.000	0.000	0.005	0.010	-4.952	0.000	0.000	0.000
Fe	3	3	mg/L	1.067	1.159	1.674	0.000	0.300	2.400	-0.341	1.084	1.309	0.000
Pb	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cr	3	3	mg/L	0.037	0.006	-1.732	0.000	0.030	0.040	-3.315	0.166	-1.732	0.000

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	MLE Estimates Trans	Mean	TStd	Trans	Regression Estimates Mean	TStd	R**2
Zn	3	2	mg/L	0.010	0.017	0.015	0.013	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Cd	3	1	mg/L	0.005	0.004	0.002	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Mn	3	3	mg/L	0.010	0.900	0.900	0.900	LN	1.260	1.338	LN	1.260	1.157	0.762
Co	3	2	mg/L	0.010	0.023	0.022	0.020	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Cu	3	2	mg/L	0.005	0.007	0.006	0.005	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Fe	3	3	mg/L	0.020	1.070	1.070	1.070	LN	1.280	1.174	LN	1.280	1.084	0.921
Pb	3	0	mg/L	0.050	0.050	0.025	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Cr	3	3	mg/L	0.010	0.037	0.037	0.037	LN	0.037	0.028	LN	0.037	0.166	0.750

Loading Estimates: Load=QBAR*CBAR

Parameter Code	Instantaneous Loadings N	ND	Units	Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	MLE Estimates Trans	Mean	X	Regression Estimates Trans	Mean	X
Zn	0	0	g/d	0.000	0.000	1.510	1.330	1.150	N/A	0.000	0.000	N/A	0.000	0.000
Cd	0	0	mg/d	0.000	0.000	328.000	177.000	29.200	N/A	0.000	0.000	N/A	0.000	0.000
Mn	0	0	g/d	0.000	0.000	79.700	79.700	79.700	LN	112.000	0.985	LN	112.000	0.906
Co	0	0	g/d	0.000	0.000	2.040	1.950	1.770	N/A	0.000	0.000	N/A	0.000	0.000
Cu	0	0	mg/d	0.000	0.000	594.000	514.000	443.000	N/A	0.000	0.000	N/A	0.000	0.000
Fe	0	0	g/d	0.000	0.000	94.800	94.800	94.800	LN	113.000	0.913	LN	113.000	0.875
Pb	0	0	g/d	0.000	0.000	4.430	2.210	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Cr	0	0	g/d	0.000	0.000	3.280	3.280	3.280	LN	3.280	0.612	LN	3.280	0.619

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Concentration Estimates Units	Mean	Confidence Interval		Loading Estimates Units	Mean	Confidence Interval	
Zn	mg/L	0.015#			g/d	1.33#		
Cd	mg/L	0.002#			mg/d	177.00#		
Mn	mg/L	1.260	0.280	5.720	g/d	112.00	16.20	772.00
Co	mg/L	0.022#			g/d	1.95#		
Cu	mg/L	0.006#			mg/d	514.00#		
Fe	mg/L	1.280	0.340	4.830	g/d	113.00	16.90	677.00
Pb	mg/L	NC			g/d	NC		
Cr	mg/L	0.037	0.036	0.038	g/d	3.28	0.99	10.90

NOTE: * Regression estimate used, # Weighted Ave. method used with Cu=0.5DL

SUMMARY OUTPUT FROM LOADS V2.5 July 1990

Run 5: Concentration file: algo3.dat
Discharge file: algo.flo
Analysis for outfall(s): Algoma SW-5
Number: 1
Mean flow (QBAR): 339000. L/d Std: 144000. Skew: -1.33 Kurt: 10.23 Flow points: 5 (LogStd or TStd: 0.614)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
Zn	3	3	mg/L	0.020	0.000	0.000	0.000	0.020	0.020	-3.912	0.000	0.000	0.000
Cd	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mn	3	3	mg/L	0.235	0.005	0.000	0.000	0.230	0.240	-1.448	0.021	-0.032	0.000
Co	3	2	mg/L	0.050	0.000	0.000	0.000	0.040	0.060	-3.016	0.000	0.000	0.000
Cu	3	3	mg/L	0.009	0.001	-1.732	0.000	0.008	0.010	-4.680	0.129	-1.732	0.000
Fe	3	3	mg/L	0.767	0.578	1.403	0.000	0.320	1.420	-0.456	0.753	0.719	0.000
Pb	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cr	3	3	mg/L	0.065	0.005	0.000	0.000	0.060	0.070	-2.735	0.077	-0.115	0.000

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	TStd	Trans	Regression Estimates Mean	TStd	R**2
Zn	3	3	mg/L	0.010	0.020	0.020	0.020	LN	0.020	0.000	N/A	0.000	0.000	0.000
Cd	3	0	mg/L	0.005	0.005	0.002	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Mn	3	3	mg/L	0.010	0.240	0.240	0.240	LN	0.240	0.000	N/A	0.000	0.000	0.000
Co	3	2	mg/L	0.010	0.037	0.035	0.033	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Cu	3	3	mg/L	0.005	0.009	0.009	0.009	LN	0.009	0.017	LN	0.009	0.129	0.750
Fe	3	3	mg/L	0.020	0.770	0.770	0.770	LN	0.840	0.567	LN	0.840	0.753	0.980
Pb	3	0	mg/L	0.050	0.050	0.025	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Cr	3	3	mg/L	0.010	0.065	0.065	0.065	LN	0.065	0.006	LN	0.065	0.077	1.000

Loading Estimates: Load=QBAR*CBAR

Parameter Code	N	ND	Instantaneous Loadings Units	Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	X	Trans	Regression Estimates Mean	X
Zn	0	0	g/d	0.000	0.000	6.780	6.780	6.780	LN	6.780	0.275	N/A	0.000	0.000
Cd	0	0	g/d	0.000	0.000	1.690	0.850	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Mn	0	0	g/d	0.000	0.000	81.400	81.400	81.400	LN	81.400	0.275	N/A	0.000	0.000
Co	0	0	g/d	0.000	0.000	12.500	11.900	11.200	N/A	0.000	0.000	N/A	0.000	0.000
Cu	0	0	g/d	0.000	0.000	3.150	3.150	3.150	LN	3.190	0.275	LN	3.190	0.285
Fe	0	0	g/d	0.000	0.000	261.000	261.000	261.000	LN	285.000	0.427	LN	285.000	0.514
Pb	0	0	g/d	0.000	0.000	17.000	8.480	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Cr	0	0	g/d	0.000	0.000	22.000	22.000	22.000	LN	22.000	0.275	LN	22.000	0.278

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Concentration Estimates Units	Mean	Confidence Interval		Loading Estimates Units	Mean	Confidence Interval	
Zn	mg/L	0.020	0.020	0.020	g/d	6.78	3.96	11.60
Cd	mg/L	NC			g/d	NC		
Mn	mg/L	0.240	0.240	0.240	g/d	81.40	47.50	139.00
Co	mg/L	0.035#			g/d	11.90#		
Cu	mg/L	0.009	0.009	0.010	g/d	3.19	1.86	5.47
Fe	mg/L	0.840	0.440	1.590	g/d	285.00	123.00	658.00
Pb	mg/L	NC			g/d	NC		
Cr	mg/L	0.065	0.065	0.065	g/d	22.00	12.80	37.70

NOTE: * Regression estimate used, # Weighted Ave. method used with Cu=0.5DL

SUMMARY OUTPUT FROM LOADS V2.5 July 1990

Run 1: Concentration file: algo4.dat
Discharge file: algo.flo
Analysis for outfall(s): Algoma SW-1
Number: 1
Mean flow (QBAR): 58400000. L/d Std: 92600000. Skew: 1.88 Kurt: 6.52 Flow points: 12 (LogStd or TStd: 1.996)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
Ni	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Be	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mo	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ca	5	5	mg/L	18.500	7.805	1.863	11.857	12.000	32.000	2.859	0.367	1.410	10.792
V	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Al	3	3	mg/L	0.207	0.050	0.586	0.000	0.160	0.260	-1.596	0.243	0.241	0.000
Mg	5	5	mg/L	3.880	1.548	2.040	12.311	2.800	6.600	1.305	0.338	1.833	11.636

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	TStd	Trans	Regression Estimates Mean	TStd	R**2
Ni	3	0	mg/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Be	3	0	mg/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Mo	3	0	mg/L	0.020	0.020	0.010	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Ca	5	5	mg/L	0.050	18.500	18.500	18.500	LN	18.700	0.134	LN	18.700	0.367	0.820
V	3	0	mg/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Al	3	3	mg/L	0.020	0.210	0.210	0.210	LN	0.210	0.059	LN	0.210	0.243	0.998
Mg	5	5	mg/L	0.050	3.880	3.880	3.880	LN	3.900	0.114	LN	3.900	0.338	0.759

Loading Estimates: Load=QBAR*CBAR

Parameter Code	N	ND	Units	Instantaneous Loadings Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	X	Trans	Regression Estimates Mean	X
Ni	0	0	g/d	0.000	0.000	584.000	292.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Be	0	0	g/d	0.000	0.000	584.000	292.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Mo	0	0	kg/d	0.000	0.000	1.170	0.580	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Ca	0	0	kg/d	0.000	0.000	1080.000	1080.000	1080.000	LN	1090.000	0.579	LN	1090.000	0.599
V	0	0	g/d	0.000	0.000	584.000	292.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Al	0	0	kg/d	0.000	0.000	12.300	12.300	12.300	LN	12.300	0.577	LN	12.300	0.593
Mg	0	0	kg/d	0.000	0.000	227.000	227.000	227.000	LN	228.000	0.579	LN	228.000	0.596

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Units	Concentration Estimates Mean	Confidence Interval		Units	Loading Estimates Mean	Confidence Interval	
Ni	mg/L	NC			g/d	NC		
Be	mg/L	NC			g/d	NC		
Mo	mg/L	NC			kg/d	NC		
Ca	mg/L	18.700	16.600	21.000	kg/d	1090.00	350.00	3390.00
V	mg/L	NC			g/d	NC		
Al	mg/L	0.210	0.200	0.220	kg/d	12.30	3.97	38.10
Mg	mg/L	3.900	3.530	4.310	kg/d	228.00	73.40	709.00

NOTE: * Regression estimate used, # Weighted Ave. method used with Cu=0.5DL

SUMMARY OUTPUT FROM LOADS V2.5 July 1990

Run 2: Concentration file: algo4.dat
Analysis for outfall(s): Algoma SW-2
Discharge file: algo.flo
Number: 1
Mean flow (QBAR): 58400000. L/d Std: 92600000. Skew: 1.88 Kurt: 6.52 Flow points: 12 (LogStd or TStd: 1.996)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
Ni	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Be	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mo	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ca	5	5	mg/L	10.280	4.160	2.205	12.887	8.100	17.700	2.279	0.334	2.170	12.756
V	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Al	3	3	mg/L	0.297	0.105	-0.143	0.000	0.190	0.400	-1.260	0.375	-0.660	0.000
Mg	5	5	mg/L	2.434	0.883	2.141	12.657	1.900	4.000	0.847	0.307	2.049	12.330

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	MLE Estimates Trans	Mean	TStd	Trans	Regression Estimates Mean	TStd	R**2
Ni	3	0	mg/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Be	3	0	mg/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Mo	3	0	mg/L	0.020	0.020	0.010	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Ca	5	5	mg/L	0.050	10.300	10.300	10.300	LN	10.300	0.112	N/A	0.000	0.000	0.000
V	3	0	mg/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Al	3	3	mg/L	0.020	0.300	0.300	0.300	LN	0.300	0.141	LN	0.300	0.375	0.983
Mg	5	5	mg/L	0.050	2.430	2.430	2.430	LN	2.450	0.094	LN	2.450	0.307	0.680

Loading Estimates: Load=QBAR*CBAR

Parameter Code	N	ND	Units	Instantaneous Loadings Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	MLE Estimates Trans	Mean	X	Regression Estimates Trans	Mean	X
Ni	0	0	g/d	0.000	0.000	584.000	292.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Be	0	0	g/d	0.000	0.000	584.000	292.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Mo	0	0	kg/d	0.000	0.000	1.170	0.580	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Ca	0	0	kg/d	0.000	0.000	602.000	602.000	602.000	LN	602.000	0.578	N/A	0.000	0.000
V	0	0	g/d	0.000	0.000	584.000	292.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Al	0	0	kg/d	0.000	0.000	17.500	17.500	17.500	LN	17.500	0.582	LN	17.500	0.616
Mg	0	0	kg/d	0.000	0.000	142.000	142.000	142.000	LN	143.000	0.578	LN	143.000	0.592

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Units	Concentration Estimates Mean	Confidence Interval		Units	Loading Estimates Mean	Confidence Interval	
Ni	mg/L	NC			g/d	NC		
Be	mg/L	NC			g/d	NC		
Mo	mg/L	NC			kg/d	NC		
Ca	mg/L	10.300	9.340	11.400	kg/d	602.00	194.00	1870.00
V	mg/L	NC			g/d	NC		
Al	mg/L	0.300	0.260	0.350	kg/d	17.50	5.59	54.80
Mg	mg/L	2.450	2.260	2.660	kg/d	143.00	46.10	444.00

NOTE: * Regression estimate used, # Weighted Ave. method used with Cu=0.5DL

SUMMARY OUTPUT FROM LOADS V2.5 July 1990

Run 3: Concentration file: algo4.dat
Analysis for outfall(s): Algoma SW-3
Discharge file: algo.flo
Mean flow (QbAR): 26300000. L/d Std: 20400000. Skew: 1.32 Number: 1 Kurt: 4.71 Flow points: 12 (LogStd or TStd: 0.795)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
Ni	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Be	2	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mo	2	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ca	4	4	mg/L	13.000	1.463	-0.971	15.349	11.000	14.500	2.560	0.116	-1.149	15.597
V	2	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Al	2	2	mg/L	0.470	0.000	0.000	0.000	0.420	0.520	-0.761	0.000	0.000	0.000
Mg	4	4	mg/L	3.200	0.356	-1.331	15.000	2.700	3.500	1.158	0.116	-1.431	15.368

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	TStd	Trans	Regression Estimates Mean	TStd	R**2
Ni	3	0	mg/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Be	2	0	mg/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Mo	2	0	mg/L	0.020	0.020	0.010	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Ca	4	4	mg/L	0.050	13.000	13.000	13.000	LN	13.000	0.014	LN	13.000	0.116	0.890
V	2	0	mg/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Al	2	2	mg/L	0.020	0.470	0.470	0.470	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Mg	4	4	mg/L	0.050	3.200	3.200	3.200	LN	3.210	0.013	LN	3.210	0.116	0.870

Loading Estimates: Load=QBAR*CBAR

Parameter Code	N	ND	Units	Instantaneous Loadings Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	X	Trans	Regression Estimates Mean	X
Ni	0	0	g/d	0.000	0.000	263.000	132.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Be	0	0	g/d	0.000	0.000	263.000	132.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Mo	0	0	g/d	0.000	0.000	526.000	263.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Ca	0	0	kg/d	0.000	0.000	342.000	342.000	342.000	LN	342.000	0.229	LN	342.000	0.237
V	0	0	g/d	0.000	0.000	263.000	132.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Al	0	0	kg/d	0.000	0.000	12.400	12.400	12.400	N/A	0.000	0.000	N/A	0.000	0.000
Mg	0	0	kg/d	0.000	0.000	84.200	84.200	84.200	LN	84.400	0.229	LN	84.400	0.237

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Units	Concentration Estimates Mean	Confidence Interval		Units	Loading Estimates Mean	Confidence Interval	
Ni	mg/L	NC			g/d	NC		
Be	mg/L	NC			g/d	NC		
Mo	mg/L	NC			g/d	NC		
Ca	mg/L	13.000	12.800	13.200	kg/d	342.00	218.00	536.00
V	mg/L	NC			g/d	NC		
Al	mg/L	0.470#			kg/d	12.40#		
Mg	mg/L	3.210	3.170	3.250	kg/d	84.40	53.80	132.00

NOTE: * Regression estimate used, # Weighted Ave. method used with Cu=0.5DL

SUMMARY OUTPUT FROM LOADS V2.5 July 1990

Run 4: Concentration file: algo4.dat
Discharge file: algo.flo
Analysis for outfall(s): Algoma SW-4
Number: 1
Mean flow (QBAR): 88600. L/d Std: 105000. Skew: 1.42 Kurt: 6.51 Flow points: 8 (LogStd or TStd: 1.730)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
Ni	3	3	mg/L	0.017	0.006	-1.732	0.000	0.010	0.020	-4.143	0.400	-1.732	0.000
Be	2	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mo	2	2	mg/L	0.030	0.000	0.000	0.000	0.020	0.040	-3.565	0.000	0.000	0.000
Ca	4	4	mg/L	530.000	60.000	0.370	9.599	480.000	600.000	6.268	0.112	0.315	9.292
V	2	2	mg/L	0.035	0.000	0.000	0.000	0.030	0.040	-3.363	0.000	0.000	0.000
Al	2	2	mg/L	0.510	0.000	0.000	0.000	0.380	0.640	-0.707	0.000	0.000	0.000
Mg	4	4	mg/L	13.750	3.887	-0.718	11.536	8.800	17.000	2.587	0.309	-0.987	12.917

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	TStd	Trans	Regression Estimates Mean	TStd	R**2
Ni	3	3	mg/L	0.010	0.017	0.017	0.017	LN	0.017	0.160	LN	0.017	0.400	0.750
Be	2	0	mg/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Mo	2	2	mg/L	0.020	0.030	0.030	0.030	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Ca	4	4	mg/L	0.050	530.000	530.000	530.000	LN	531.000	0.013	LN	531.000	0.112	0.893
V	2	2	mg/L	0.010	0.035	0.035	0.035	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Al	2	2	mg/L	0.020	0.510	0.510	0.510	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Mg	4	4	mg/L	0.050	13.700	13.700	13.700	LN	13.900	0.095	LN	13.900	0.309	0.895

Loading Estimates: Load=QBAR*CBAR

Parameter Code	Instantaneous Loadings N	ND	Units	Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	X	Trans	Regression Estimates Mean	X
Ni	0	0	g/d	0.000	0.000	1.510	1.510	1.510	LN	1.510	0.619	LN	1.510	0.654
Be	0	0	mg/d	0.000	0.000	886.000	443.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Mo	0	0	g/d	0.000	0.000	2.660	2.660	2.660	N/A	0.000	0.000	N/A	0.000	0.000
Ca	0	0	kg/d	0.000	0.000	47.000	47.000	47.000	LN	47.000	0.612	LN	47.000	0.614
V	0	0	g/d	0.000	0.000	3.100	3.100	3.100	N/A	0.000	0.000	N/A	0.000	0.000
Al	0	0	g/d	0.000	0.000	45.200	45.200	45.200	N/A	0.000	0.000	N/A	0.000	0.000
Mg	0	0	kg/d	0.000	0.000	1.210	1.210	1.210	LN	1.230	0.614	LN	1.230	0.631

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Concentration Estimates Units	Mean	Confidence Interval		Loading Estimates Units	Mean	Confidence Interval	
Ni	mg/L	0.017	0.014	0.020	g/d	1.51	0.45	5.08
Be	mg/L	NC			mg/d	NC		
Mo	mg/L	0.030#			g/d	2.66#		
Ca	mg/L	531.000	524.000	538.000	kg/d	47.00	14.20	156.00
V	mg/L	0.035#			g/d	3.10#		
Al	mg/L	0.510#			g/d	45.20#		
Mg	mg/L	13.900	12.700	15.300	kg/d	1.23	0.37	4.09

NOTE: * Regression estimate used, # Weighted Ave. method used with Cu=0.5DL

SUMMARY OUTPUT FROM LOADS V2.5 July 1990

Run 5: Concentration file: algo4.dat
Analysis for outfall(s): Algoma SW-5
Mean flow (QBAR): 339000. L/d Std: 144000. Skew: -1.33

Discharge file: algo.flo
Number: 1
Kurt: 10.23 Flow points: 5 (LogStd or TStd: 0.614)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
Ni	3	3	mg/L	0.030	0.010	0.000	0.000	0.020	0.040	-3.546	0.348	-0.501	0.000
Be	3	0	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mo	3	3	mg/L	0.067	0.012	1.732	0.000	0.060	0.080	-2.718	0.166	1.732	0.000
Ca	5	5	mg/L	1154.000	340.191	1.300	9.350	850.000	1700.000	7.019	0.275	0.958	8.274
V	4	4	mg/L	1.212	2.325	2.000	17.500	0.050	4.700	-1.860	2.272	2.000	17.500
Al	3	3	mg/L	0.720	0.069	1.732	0.000	0.680	0.800	-0.331	0.094	1.732	0.000
Mg	5	5	mg/L	4.020	1.446	-0.785	6.233	2.000	5.200	1.327	0.421	-1.060	7.476

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	TStd	Trans	Regression Estimates Mean	TStd	R**2
Ni	3	3	mg/L	0.010	0.030	0.030	0.030	LN	0.031	0.121	LN	0.031	0.348	0.990
Be	3	0	mg/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Mo	3	3	mg/L	0.020	0.067	0.067	0.067	LN	0.067	0.028	LN	0.067	0.166	0.750
Ca	5	5	mg/L	0.050	1150.000	1150.000	1150.000	LN	1160.000	0.076	LN	1160.000	0.275	0.936
V	4	4	mg/L	0.010	1.210	1.210	1.210	LN	2.060	5.160	LN	2.060	2.272	0.600
Al	3	3	mg/L	0.020	0.720	0.720	0.720	LN	0.720	0.009	LN	0.720	0.094	0.750
Mg	5	5	mg/L	0.050	4.020	4.020	4.020	LN	4.120	0.177	N/A	0.000	0.000	0.000

Loading Estimates: Load=QBAR*CBAR

Parameter Code	N	ND	Units	Instantaneous Loadings Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	X	Trans	Regression Estimates Mean	X
Ni	0	0	g/d	0.000	0.000	10.200	10.200	10.200	LN	10.500	0.283	LN	10.500	0.340
Be	0	0	g/d	0.000	0.000	3.390	1.690	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Mo	0	0	g/d	0.000	0.000	22.700	22.700	22.700	LN	22.700	0.275	LN	22.700	0.291
Ca	0	0	kg/d	0.000	0.000	390.000	390.000	390.000	LN	393.000	0.277	LN	393.000	0.301
V	0	0	g/d	0.000	0.000	410.000	410.000	410.000	LN	698.000	2.595	LN	698.000	1.169
Al	0	0	g/d	0.000	0.000	244.000	244.000	244.000	LN	244.000	0.275	LN	244.000	0.280
Mg	0	0	kg/d	0.000	0.000	1.360	1.360	1.360	LN	1.400	0.286	N/A	0.000	0.000

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Concentration Estimates Units	Mean	Confidence Interval		Loading Estimates Units	Mean	Confidence Interval	
Ni	mg/L	0.031	0.027	0.036	g/d	10.50	6.02	18.30
Be	mg/L	NC			g/d	NC		
Mo	mg/L	0.067	0.065	0.069	g/d	22.70	13.20	38.90
Ca	mg/L	1160.000	1090.000	1240.000	kg/d	393.00	228.00	676.00
V	mg/L	2.060	0.013	324.000	g/d	698.00	4.32	113000.00
Al	mg/L	0.720	0.710	0.730	g/d	244.00	142.00	418.00
Mg	mg/L	4.120	3.530	4.810	kg/d	1.40	0.80	2.45

NOTE: * Regression estimate used, # Weighted Ave. method used with Cu=0.5DL

SUMMARY OUTPUT FROM LOADS V2.5 July 1990

Run 1: Concentration file: algo5.dat
Discharge file: algo.flo
Analysis for outfall(s): Algoma SW-1
Number: 1
Mean flow (QBAR): 58400000. L/d Std: 92600000. Skew: 1.88 Kurt: 6.52 Flow points: 12 (LogStd or TStd: 1.996)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
Ba	3	3	mg/L	0.015	0.005	0.000	0.000	0.010	0.020	-4.239	0.348	-0.501	0.000
K	5	5	mg/L	2.540	0.879	0.829	9.634	1.500	3.900	0.885	0.346	-0.017	9.155
St	3	3	mg/L	0.080	0.044	1.630	0.000	0.050	0.130	-2.616	0.507	1.484	0.000
Na	5	5	mg/L	6.300	2.706	1.894	12.049	4.000	11.000	1.780	0.372	1.408	11.093
Hg	1	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
As	1	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Se	1	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	TStd	Trans	Regression Estimates Mean	TStd	R**2
Ba	3	3	mg/L	0.010	0.015	0.015	0.015	LN	0.015	0.121	LN	0.015	0.348	0.990
K	5	5	mg/L	0.050	2.540	2.540	2.540	LN	2.570	0.119	LN	2.570	0.346	0.937
St	3	3	mg/L	0.010	0.080	0.080	0.080	LN	0.083	0.257	LN	0.083	0.507	0.887
Na	5	5	mg/L	0.500	6.300	6.300	6.300	LN	6.350	0.13#	LN	6.350	0.372	0.739
Hg	1	0	ug/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
As	1	0	ug/L	0.100	0.100	0.050	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Se	1	0	ug/L	0.100	0.100	0.050	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000

Loading Estimates: Load=QBAR*CBAR

Parameter Code	N	ND	Units	Instantaneous Loadings Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	X	Trans	Regression Estimates Mean	X
Ba	0	0	g/d	0.000	0.000	876.000	876.000	876.000	LN	876.000	0.581	LN	876.000	0.610
K	0	0	kg/d	0.000	0.000	148.000	148.000	148.000	LN	150.000	0.579	LN	150.000	0.597
St	0	0	kg/d	0.000	0.000	4.670	4.670	4.670	LN	4.850	0.595	LN	4.850	0.646
Na	0	0	kg/d	0.000	0.000	368.000	368.000	368.000	LN	371.000	0.580	LN	371.000	0.600
Hg	0	0	mg/d	0.000	0.000	584.000	292.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
As	0	0	g/d	0.000	0.000	5.840	2.920	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Se	0	0	g/d	0.000	0.000	5.840	2.920	0.000	N/A	0.000	0.000	N/A	0.000	0.000

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Concentration Estimates Units	Mean	Confidence Interval		Loading Estimates Units	Mean	Confidence Interval	
Ba	mg/L	0.015	0.013	0.017	g/d	876.00	281.00	2730.00
K	mg/L	2.570	2.310	2.850	kg/d	150.00	48.20	466.00
St	mg/L	0.083	0.062	0.110	kg/d	4.85	1.51	15.60
Na	mg/L	6.350	5.620	7.170	kg/d	371.00	119.00	1160.00
Hg	ug/L	NC			mg/d	NC		
As	ug/L	NC			g/d	NC		
Se	ug/L	NC			g/d	NC		

NOTE: * Regression estimate used, # Weighted Ave. method used with Cu=0.5DL

SUMMARY OUTPUT FROM LOADS V2.6 Sept. 1990

Run 1: Concentration file: algo5.dat
Discharge file: algo.flo
Analysis for outfall(s): Algoma SW-2
Number: 1
Mean flow (QBAR): 58400000. L/d Std: 92600000. Skew: 1.88 Kurt: 6.52 Flow points: 12 (LogStd or TStd: 1.996)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
Ba	3	3	mg/L	0.017	0.006	-1.732	0.000	0.010	0.020	-4.143	0.400	-1.732	0.000
K	5	5	mg/L	0.850	0.398	2.040	12.306	0.600	1.550	-0.232	0.391	1.794	11.450
St	3	3	mg/L	0.050	0.017	1.732	0.000	0.040	0.070	-3.032	0.323	1.732	0.000
Na	5	5	mg/L	4.800	2.387	2.043	12.423	3.000	9.000	1.491	0.414	1.694	11.611
Hg	0	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
As	0	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Se	0	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	TStd	Trans	Regression Estimates Mean	TStd	R**2
Ba	3	3	mg/L	0.010	0.017	0.017	0.017	LN	0.017	0.160	LN	0.017	0.400	0.750
K	5	5	mg/L	0.050	0.850	0.850	0.850	LN	0.860	0.153	LN	0.860	0.391	0.737
St	3	3	mg/L	0.010	0.050	0.050	0.050	LN	0.051	0.104	LN	0.051	0.323	0.750
Na	5	5	mg/L	0.500	4.800	4.800	4.800	LN	4.840	0.171	LN	4.840	0.414	0.704
Hg	0	0	ug/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
As	0	0	ug/L	0.100	0.100	0.050	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Se	0	0	ug/L	0.100	0.100	0.050	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000

Loading Estimates: Load=QBAR*CBAR

Parameter Code	Instantaneous Loadings N	ND	Units	Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	X	Trans	Regression Estimates Mean	X
Ba	0	0	g/d	0.000	0.000	993.000	993.000	993.000	LN	993.000	0.584	LN	993.000	0.621
K	0	0	kg/d	0.000	0.000	49.600	49.600	49.600	LN	50.200	0.580	LN	50.200	0.602
St	0	0	kg/d	0.000	0.000	2.920	2.920	2.920	LN	2.980	0.579	LN	2.980	0.606
Na	0	0	kg/d	0.000	0.000	280.000	280.000	280.000	LN	283.000	0.581	LN	283.000	0.605
Hg	0	0	mg/d	0.000	0.000	584.000	292.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
As	0	0	g/d	0.000	0.000	5.840	2.920	0.000	N/A	0.000	0.000	N/A	0.000	0.000
Se	0	0	g/d	0.000	0.000	5.840	2.920	0.000	N/A	0.000	0.000	N/A	0.000	0.000

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Concentration Estimates Units	Mean	Confidence Interval		Loading Estimates Units	Mean	Confidence Interval	
Ba	mg/L	0.017	0.014	0.020	g/d	993.00	316.00	3120.00
K	mg/L	0.860	0.750	0.980	kg/d	50.20	16.10	157.00
St	mg/L	0.051	0.045	0.057	kg/d	2.98	0.96	9.28
Na	mg/L	4.840	4.160	5.620	kg/d	283.00	90.60	884.00
Hg	ug/L	0.005#			mg/d	292.00#		
As	ug/L	0.050#			g/d	2.92#		
Se	ug/L	0.050#			g/d	2.92#		

NOTE: * Regression estimate used, # Weighted Ave. method used with Cu=0.5DL

SUMMARY OUTPUT FROM LOADS V2.5 July 1990

Run 3: Concentration file: algo5.dat
Analysis for outfall(s): Algoma SW-3
Discharge file: algo.flo
Number: 1
Mean flow (QBAR): 26300000. L/d Std: 20400000. Skew: 1.32 Kurt: 4.71 Flow points: 12 (LogStd or TStd: 0.795)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
Ba	2	2	mg/L	0.020	0.000	0.000	0.000	0.020	0.020	-3.912	0.000	0.000	0.000
K	4	4	mg/L	1.450	0.836	1.966	17.392	0.950	2.700	0.272	0.485	1.903	17.203
St	2	2	mg/L	0.055	0.000	0.000	0.000	0.050	0.060	-2.905	0.000	0.000	0.000
Na	4	4	mg/L	5.500	0.707	1.414	15.000	5.000	6.500	1.699	0.124	1.317	14.537
Hg	0	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
As	0	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Se	0	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	MLE Estimates Trans	Mean	TStd	Regression Estimates Trans	Mean	TStd	R**2
Ba	2	2	mg/L	0.010	0.020	0.020	0.020	N/A	0.000	0.000	N/A	0.000	0.000	0.000
K	4	4	mg/L	0.050	1.450	1.450	1.450	LN	1.480	0.235	LN	1.480	0.485	0.716
St	2	2	mg/L	0.010	0.055	0.055	0.055	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Na	4	4	mg/L	0.500	5.500	5.500	5.500	LN	5.510	0.015	LN	5.510	0.124	0.848

Loading Estimates: Load=QBAR*CBAR

Parameter Code	Instantaneous Loadings N	ND	Units	Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	MLE Estimates Trans	Mean	X	Regression Estimates Trans	Mean	X
Ba	0	0	g/d	0.000	0.000	526.000	526.000	526.000	N/A	0.000	0.000	N/A	0.000	0.000
K	0	0	kg/d	0.000	0.000	38.100	38.100	38.100	LN	38.900	0.258	LN	38.900	0.334
St	0	0	kg/d	0.000	0.000	1.450	1.450	1.450	N/A	0.000	0.000	N/A	0.000	0.000
Na	0	0	kg/d	0.000	0.000	145.000	145.000	145.000	LN	145.000	0.229	LN	145.000	0.238

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Concentration Estimates Units	Mean	Confidence Interval		Loading Estimates Units	Mean	Confidence Interval	
Ba	mg/L	0.020#			g/d	526.00#		
K	mg/L	1.480	1.180	1.860	kg/d	38.90	23.50	64.50
St	mg/L	0.055#			kg/d	1.45#		
Na	mg/L	5.510	5.430	5.590	kg/d	145.00	92.50	227.00
Hg	ug/L	NC			ug/d	NC		
As	ug/L	NC			ug/d	NC		
Se	ug/L	NC			ug/d	NC		

NOTE: * Regression estimate used, # Weighted Ave. method used with Cu=0.5DL

SUMMARY OUTPUT FROM LOADS V2.5 July 1990

Run 4: Concentration file: algo5.dat Discharge file: algo.flo
Analysis for outfall(s): Algoma SW-4 Number: 1
Mean flow (QBAR): 88600. L/d Std: 105000. Skew: 1.42 Kurt: 6.51 Flow points: 8 (LogStd or TStd: 1.730)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
Ba	2	2	mg/L	0.155	0.000	0.000	0.000	0.150	0.160	-1.865	0.000	0.000	0.000
K	4	4	mg/L	36.500	5.066	1.846	16.992	33.000	44.000	3.591	0.131	1.801	16.852
St	2	2	mg/L	2.005	0.000	0.000	0.000	1.910	2.100	0.695	0.000	0.000	0.000
Na	4	4	mg/L	83.250	20.123	-0.432	12.948	58.000	105.000	4.398	0.256	-0.795	13.623
Hg	0	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
As	0	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Se	0	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	Weighted Ave. with Cu values DL	Cu=DL	Cu=0.5DL	Cu=0	MLE Estimates Trans	Mean	TStd	Regression Estimates Trans	Mean	TStd	R**2
Ba	2	2	mg/L	0.010	0.150	0.150	0.150	N/A	0.000	0.000	N/A	0.000	0.000	0.000
K	4	4	mg/L	0.050	36.500	36.500	36.500	LN	36.600	0.017	LN	36.600	0.131	0.770
St	2	2	mg/L	0.010	2.000	2.000	2.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
Na	4	4	mg/L	0.500	83.300	83.300	83.300	LN	84.000	0.065	LN	84.000	0.256	0.963

Loading Estimates: Load=QBAR*CBAR

Parameter Code	N	ND	Units	Instantaneous Loadings Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	X	Trans	Regression Estimates Mean	X
Ba	0	0	g/d	0.000	0.000	13.300	13.300	13.300	N/A	0.000	0.000	N/A	0.000	0.000
K	0	0	kg/d	0.000	0.000	3.230	3.230	3.230	LN	3.240	0.612	LN	3.240	0.615
St	0	0	g/d	0.000	0.000	177.000	177.000	177.000	N/A	0.000	0.000	N/A	0.000	0.000
Na	0	0	kg/d	0.000	0.000	7.380	7.380	7.380	LN	7.440	0.613	LN	7.440	0.625

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Concentration Estimates Units	Mean	Confidence Interval		Loading Estimates Units	Mean	Confidence Interval	
Ba	mg/L	0.150#			g/d	13.30#		
K	mg/L	36.600	36.000	37.200	kg/d	3.24	0.98	10.70
St	mg/L	2.000#			g/d	177.00#		
Na	mg/L	84.000	78.800	89.600	kg/d	7.44	2.24	24.70
Hg	ug/L	NC			ug/d	NC		
As	ug/L	NC			ug/d	NC		
Se	ug/L	NC			ug/d	NC		

NOTE: * Regression estimate used, # Weighted Ave. method used with Cu=0.5DL

SUMMARY OUTPUT FROM LOADS V2.5 July 1990

Run 5: Concentration file: algo5.dat
Discharge file: algo.flo
Analysis for outfall(s): Algoma SW-5
Number: 1
Mean flow (QBAR): 339000. L/d Std: 144000. Skew: -1.33 Kurt: 10.23 Flow points: 5 (LogStd or TStd: 0.614)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
Ba	3	3	mg/L	0.160	0.046	0.935	0.000	0.120	0.210	-1.859	0.282	0.593	0.000
K	5	5	mg/L	106.600	15.093	-0.632	9.080	84.000	125.000	4.661	0.148	-0.934	9.468
St	3	3	mg/L	3.333	0.416	1.293	0.000	3.000	3.800	1.199	0.122	1.204	0.000
Na	5	5	mg/L	54.000	7.483	0.650	7.757	47.000	65.000	3.981	0.136	0.453	7.187
Hg	0	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
As	0	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Se	0	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	TStd	Trans	Regression Estimates Mean	TStd	R**2
Ba	3	3	mg/L	0.010	0.160	0.160	0.160	LN	0.160	0.079	LN	0.160	0.282	0.987
K	5	5	mg/L	0.050	107.000	107.000	107.000	LN	107.000	0.022	LN	107.000	0.148	0.906
St	3	3	mg/L	0.010	3.330	3.330	3.330	LN	3.340	0.015	LN	3.340	0.122	0.936
Na	5	5	mg/L	0.500	54.000	54.000	54.000	LN	54.100	0.019	N/A	0.000	0.000	0.000

Loading Estimates: Load=QBAR*CBAR

Parameter Code	N	ND	Units	Instantaneous Loadings Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	X	Trans	Regression Estimates Mean	X
Ba	0	0	g/d	0.000	0.000	54.200	54.200	54.200	LN	54.200	0.278	LN	54.200	0.319
K	0	0	kg/d	0.000	0.000	36.300	36.300	36.300	LN	36.300	0.275	LN	36.300	0.283
St	0	0	kg/d	0.000	0.000	1.130	1.130	1.130	LN	1.130	0.275	LN	1.130	0.284
Na	0	0	kg/d	0.000	0.000	18.300	18.300	18.300	LN	18.300	0.275	N/A	0.000	0.000

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Units	Concentration Estimates Mean	Confidence Interval		Units	Loading Estimates Mean	Confidence Interval	
Ba	mg/L	0.160	0.150	0.180	g/d	54.20	31.40	93.60
K	mg/L	107.000	105.000	109.000	kg/d	36.30	21.20	62.20
St	mg/L	3.340	3.280	3.400	kg/d	1.13	0.66	1.94
Na	mg/L	54.100	53.200	55.000	kg/d	18.30	10.70	31.40
Hg	ug/L	NC			ug/d	NC		
As	ug/L	NC			ug/d	NC		
Se	ug/L	NC			ug/d	NC		

NOTE: * Regression estimate used, # Weighted Ave. method used with Cu=0.5DL

POLYAROMATIC HYDROCARBON SYMBOLS

Code Name	Name of Compound
PNNAPH	Naphthalene
PNACNY	Acenaphthalene
PNACNY	Acenaphthen
PNFLUO	Fluorene
PNPHEN	Phenanthrene
PNANTH	Anthracene
PNFLAN	Fluoranthene
PNPYR	Pyrene
PNBAA	Benzo(a)anthracene
PNCHRY	Chrysene
PNBBFA	Benzo(b)fluoranthene
PNBKF	Benzo(k)fluoranthene
PNBAP	Benzo(a)pyrene
PNPERY	Perylene
PNINP	Indelol (1,2,3-c,d) pyrene
PNDAHA	Dibenzo(a,h)anthracene
PNGHIP	Benzo(g,h,i)perylene
THAP	Total PAHs

/cmarge/loads2.5/loads/outs.cmd Fri Dec 7 08:47:24 1990

SUMMARY OUTPUT FROM LOADS V2.6 Sept. 1990

Run 1: Concentration file: algo6.dat
Analysis for outfall(s): Algoma SW-1
Discharge file: algo.flo
Number: 1
Mean flow (QBAR): 58400000. L/d Std: 92600000. Skew: 1.88 Kurt: 6.52 Flow points: 12 (LogStd or TStd: 1.996)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
PNNAPH	3	2	ug/L	0.060	0.000	0.000	0.000	0.020	0.100	-3.107	0.000	0.000	0.000
PNACNY	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNACNY	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNFLUO	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNPHEN	3	1	ug/L	0.050	0.000	0.000	0.000	0.050	0.050	-2.996	0.000	0.000	0.000
PNANTH	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNFLAN	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNPYR	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNBAA	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	TStd	Trans	Regression Estimates Mean	TStd	R**2
PNNAPH	3	2	ug/L	0.100	0.073	0.057	0.040	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNACNY	3	0	ug/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNACNY	3	0	ug/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNFLUO	3	0	ug/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNPHEN	3	1	ug/L	0.100	0.083	0.050	0.017	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNANTH	3	0	ug/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNFLAN	3	0	ug/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNPYR	3	0	ug/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNBAA	3	0	ug/L	0.020	0.020	0.010	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000

Loading Estimates: Load=QBAR*CBAR

Parameter Code	N	ND	Units	Instantaneous Loading Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	X	Trans	Regression Estimates Mean	X
PNNAPH	0	0	g/d	0.000	0.000	4.260	3.330	2.340	N/A	0.000	0.000	N/A	0.000	0.000
PNACNY	0	0	mg/d	0.000	0.000	584.000	292.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNACNY	0	0	mg/d	0.000	0.000	584.000	292.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNFLUO	0	0	mg/d	0.000	0.000	584.000	292.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNPHEN	0	0	g/d	0.000	0.000	4.850	2.920	0.990	N/A	0.000	0.000	N/A	0.000	0.000
PNANTH	0	0	mg/d	0.000	0.000	584.000	292.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNFLAN	0	0	mg/d	0.000	0.000	584.000	292.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNPYR	0	0	mg/d	0.000	0.000	584.000	292.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNBAA	0	0	g/d	0.000	0.000	1.170	0.580	0.000	N/A	0.000	0.000	N/A	0.000	0.000

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Concentration Estimates Units	Mean	Confidence Interval	Loading Estimates Units	Mean	Confidence Interval
PNNAPH	ug/L	0.057#		g/d	3.33#	
PNACNY	ug/L	NC		mg/d	NC	
PNACNY	ug/L	NC		mg/d	NC	
PNFLUO	ug/L	NC		mg/d	NC	
PNPHEN	ug/L	0.050#		g/d	2.92#	
PNANTH	ug/L	NC		mg/d	NC	
PNFLAN	ug/L	NC		mg/d	NC	
PNPYR	ug/L	NC		mg/d	NC	
PNBAA	ug/L	NC		g/d	NC	

NOTE: * Regression estimate used, # Weighted Ave. method

SUMMARY OUTPUT FROM LOADS V2.6 Sept. 1990

Run 2: Concentration file: algo6.dat
Analysis for outfall(s): Algoma SW-2
Discharge file: algo.flo
Number: 1
Mean flow (QBAR): 58400000. L/d Std: 92600000. Skew: 1.88 Kurt: 6.52 Flow points: 12 (LogStd or TStd: 1.996)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
PNNAPH	3	2	ug/L	0.020	0.000	0.000	0.000	0.010	0.030	-4.056	0.000	0.000	0.000
PNACNY	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNACNY	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNFLUO	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNPHEN	3	1	ug/L	0.030	0.000	0.000	0.000	0.030	0.030	-3.507	0.000	0.000	0.000
PNANTH	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNFLAN	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNPYR	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNBAA	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	MLE Estimates Trans	Mean	TStd	Trans	Regression Estimates Mean	TStd	R**2
PNNAPH	3	2	ug/L	0.100	0.047	0.030	0.013	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNACNY	3	0	ug/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNACNY	3	0	ug/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNFLUO	3	0	ug/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNPHEN	3	1	ug/L	0.100	0.077	0.043	0.010	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNANTH	3	0	ug/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNFLAN	3	0	ug/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNPYR	3	0	ug/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNBAA	3	0	ug/L	0.020	0.020	0.010	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000

Loading Estimates: Load=QBAR*CBAR

Parameter Code	N	ND	Instantaneous Loadings Units	Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	MLE Estimates Trans	Mean	X	Regression Estimates Trans	Mean	X
PNNAPH	0	0	g/d	0.000	0.000	2.740	1.750	0.760	N/A	0.000	0.000	N/A	0.000	0.000
PNACNY	0	0	mg/d	0.000	0.000	584.000	292.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNACNY	0	0	mg/d	0.000	0.000	584.000	292.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNFLUO	0	0	mg/d	0.000	0.000	584.000	292.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNPHEN	0	0	g/d	0.000	0.000	4.500	2.510	0.580	N/A	0.000	0.000	N/A	0.000	0.000
PNANTH	0	0	mg/d	0.000	0.000	584.000	292.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNFLAN	0	0	mg/d	0.000	0.000	584.000	292.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNPYR	0	0	mg/d	0.000	0.000	584.000	292.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNBAA	0	0	g/d	0.000	0.000	1.170	0.580	0.000	N/A	0.000	0.000	N/A	0.000	0.000

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Concentration Estimates Units	Mean	Confidence Interval	Loading Estimates Units	Mean	Confidence Interval
PNNAPH	ug/L	0.030#		g/d	1.75#	
PNACNY	ug/L	NC		mg/d	NC	
PNACNY	ug/L	NC		mg/d	NC	
PNFLUO	ug/L	NC		mg/d	NC	
PNPHEN	ug/L	0.043#		g/d	2.51#	
PNANTH	ug/L	NC		mg/d	NC	
PNFLAN	ug/L	NC		mg/d	NC	
PNPYR	ug/L	NC		mg/d	NC	
PNBAA	ug/L	NC		g/d	NC	

NOTE: * Regression estimate used, # Weighted Ave. method

SUMMARY OUTPUT FROM LOADS V2.6 Sept. 1990

Run 3: Concentration file: algo6.dat Discharge file: algo.flo
Analysis for outfall(s): Algoma SW-3 Number: 1
Mean flow (QBAR): 26300000. L/d Std: 20400000. Skew: 1.32 Kurt: 4.71 Flow points: 12 (LogStd or TStd: 0.795)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
PNNAPH	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNACNY	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNACNY	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNFLUO	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNPHEN	2	1	ug/L	0.200	0.000	0.000	0.000	0.200	0.200	-1.609	0.000	0.000	0.000
PNANTH	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNFLAN	2	1	ug/L	0.200	0.000	0.000	0.000	0.200	0.200	-1.609	0.000	0.000	0.000
PNPYR	2	1	ug/L	0.100	0.000	0.000	0.000	0.100	0.100	-2.303	0.000	0.000	0.000
PNBAA	2	1	ug/L	0.100	0.000	0.000	0.000	0.100	0.100	-2.303	0.000	0.000	0.000

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	TStd	Trans	Regression Estimates Mean	TStd	R**2
PNNAPH	2	0	ug/L	0.100	0.100	0.050	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNACNY	2	0	ug/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNACNY	2	0	ug/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNFLUO	2	0	ug/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNPHEN	2	1	ug/L	0.100	0.150	0.120	0.100	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNANTH	2	0	ug/L	0.010	0.010	0.005	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNFLAN	2	1	ug/L	0.010	0.110	0.100	0.100	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNPYR	2	1	ug/L	0.010	0.055	0.052	0.050	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNBAA	2	1	ug/L	0.020	0.060	0.055	0.050	N/A	0.000	0.000	N/A	0.000	0.000	0.000

Loading Estimates: Load=QBAR*CBAR

Parameter Code	Instantaneous Loadings N	ND	Units	Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	X	Trans	Regression Estimates Mean	X
PNNAPH	0	0	g/d	0.000	0.000	2.630	1.320	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNACNY	0	0	mg/d	0.000	0.000	263.000	132.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNACNY	0	0	mg/d	0.000	0.000	263.000	132.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNFLUO	0	0	mg/d	0.000	0.000	263.000	132.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNPHEN	0	0	g/d	0.000	0.000	3.950	3.160	2.630	N/A	0.000	0.000	N/A	0.000	0.000
PNANTH	0	0	mg/d	0.000	0.000	263.000	132.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNFLAN	0	0	g/d	0.000	0.000	2.890	2.630	2.630	N/A	0.000	0.000	N/A	0.000	0.000
PNPYR	0	0	g/d	0.000	0.000	1.450	1.370	1.320	N/A	0.000	0.000	N/A	0.000	0.000
PNBAA	0	0	g/d	0.000	0.000	1.580	1.450	1.320	N/A	0.000	0.000	N/A	0.000	0.000

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Concentration Estimates Units	Mean	Confidence Interval	Loading Estimates Units	Mean	Confidence Interval
PNNAPH	ug/L	NC		g/d	NC	
PNACNY	ug/L	NC		mg/d	NC	
PNACNY	ug/L	NC		mg/d	NC	
PNFLUO	ug/L	NC		mg/d	NC	
PNPHEN	ug/L	0.120#		g/d	3.16#	
PNANTH	ug/L	NC		mg/d	NC	
PNFLAN	ug/L	0.100#		g/d	2.63#	
PNPYR	ug/L	0.052#		g/d	1.37#	
PNBAA	ug/L	0.055#		g/d	1.45#	

NOTE: * Regression estimate used, # Weighted Ave. method

SUMMARY OUTPUT FROM LOADS V2.6 Sept. 1990

Run 4: Concentration file: algo6.dat
Analysis for outfall(s): Algoma SW-4
Mean flow (QBAR): 88600. L/d Std: 105000. Skew: 1.42

Discharge file: algo.flo
Number: 1
Kurt: 6.51 Flow points: 8 (LogStd or TStd: 1.730)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
PNNAPH	2	2	ug/L	289.000	0.000	0.000	0.000	78.000	500.000	5.286	0.000	0.000	0.000
PNACNY	2	2	ug/L	11.250	0.000	0.000	0.000	5.500	17.000	2.269	0.000	0.000	0.000
PNACNY	2	2	ug/L	34.200	0.000	0.000	0.000	14.400	54.000	3.328	0.000	0.000	0.000
PNFLUO	2	2	ug/L	51.000	0.000	0.000	0.000	27.000	75.000	3.807	0.000	0.000	0.000
PNPHEN	2	2	ug/L	60.500	0.000	0.000	0.000	34.000	87.000	3.996	0.000	0.000	0.000
PNANTH	2	2	ug/L	4.150	0.000	0.000	0.000	3.200	5.100	1.396	0.000	0.000	0.000
PNFLAN	2	2	ug/L	6.000	0.000	0.000	0.000	4.900	7.100	1.775	0.000	0.000	0.000
PNPYR	2	2	ug/L	3.250	0.000	0.000	0.000	2.400	4.100	1.143	0.000	0.000	0.000
PNBAA	2	2	ug/L	0.150	0.000	0.000	0.000	0.100	0.200	-1.956	0.000	0.000	0.000

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	TStd	Trans	Regression Estimates Mean	TStd	R**2
PNNAPH	2	2	ug/L	0.100	289.000	289.000	289.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNACNY	2	2	ug/L	0.010	11.200	11.200	11.200	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNACNY	2	2	ug/L	0.010	34.200	34.200	34.200	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNFLUO	2	2	ug/L	0.010	51.000	51.000	51.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNPHEN	2	2	ug/L	0.100	60.500	60.500	60.500	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNANTH	2	2	ug/L	0.010	4.150	4.150	4.150	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNFLAN	2	2	ug/L	0.010	6.000	6.000	6.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNPYR	2	2	ug/L	0.010	3.250	3.250	3.250	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNBAA	2	2	ug/L	0.020	0.150	0.150	0.150	N/A	0.000	0.000	N/A	0.000	0.000	0.000

Loading Estimates: Load=QBAR*CBAR

Parameter Code	Instantaneous Loadings N	ND	Units	Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	X	Regression Estimates Trans	Mean	X
PNNAPH	0	0	g/d	0.000	0.000	25.600	25.600	25.600	N/A	0.000	0.000	N/A	0.000	0.000
PNACNY	0	0	mg/d	0.000	0.000	992.000	992.000	992.000	N/A	0.000	0.000	N/A	0.000	0.000
PNACNY	0	0	g/d	0.000	0.000	3.030	3.030	3.030	N/A	0.000	0.000	N/A	0.000	0.000
PNFLUO	0	0	g/d	0.000	0.000	4.520	4.520	4.520	N/A	0.000	0.000	N/A	0.000	0.000
PNPHEN	0	0	g/d	0.000	0.000	5.360	5.360	5.360	N/A	0.000	0.000	N/A	0.000	0.000
PNANTH	0	0	mg/d	0.000	0.000	368.000	368.000	368.000	N/A	0.000	0.000	N/A	0.000	0.000
PNFLAN	0	0	mg/d	0.000	0.000	532.000	532.000	532.000	N/A	0.000	0.000	N/A	0.000	0.000
PNPYR	0	0	mg/d	0.000	0.000	288.000	288.000	288.000	N/A	0.000	0.000	N/A	0.000	0.000
PNBAA	0	0	mg/d	0.000	0.000	13.300	13.300	13.300	N/A	0.000	0.000	N/A	0.000	0.000

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Units	Concentration Estimates Mean	Confidence Interval	Units	Loading Estimates Mean	Confidence Interval
PNNAPH	ug/L	289.000#		g/d	25.60#	
PNACNY	ug/L	11.200#		mg/d	992.00#	
PNACNY	ug/L	34.200#		g/d	3.03#	
PNFLUO	ug/L	51.000#		g/d	4.52#	
PNPHEN	ug/L	60.500#		g/d	5.36#	
PNANTH	ug/L	4.150#		mg/d	368.00#	
PNFLAN	ug/L	6.000#		mg/d	532.00#	
PNPYR	ug/L	3.250#		mg/d	288.00#	
PNBAA	ug/L	0.150#		mg/d	13.30#	

NOTE: * Regression estimate used, # Weighted Ave. method

SUMMARY OUTPUT FROM LOADS V2.6 Sept. 1990

Run 5: Concentration file: algo6.dat Discharge file: algo.flo
Analysis for outfall(s): Algoma SW-5 Number: 1
Mean flow (QBAR): 339000. L/d Std: 144000. Skew: -1.33 Kurt: 10.23 Flow points: 5 (LogStd or TStd: 0.614)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
PNNAPH	3	3	ug/L	103.700	145.197	1.607	0.000	2.100	270.000	3.335	2.445	-0.594	0.000
PNACNY	3	3	ug/L	0.277	0.137	-0.747	0.000	0.130	0.400	-1.387	0.584	-1.271	0.000
PNACNY	3	3	ug/L	0.903	0.495	0.030	0.000	0.410	1.400	-0.220	0.622	-0.802	0.000
PNFLUO	3	3	ug/L	0.790	0.215	-0.209	0.000	0.570	1.000	-0.262	0.283	-0.602	0.000
PNPHEN	3	3	ug/L	1.717	0.732	0.699	0.000	1.050	2.500	0.478	0.434	0.087	0.000
PNANTH	3	2	ug/L	0.225	0.000	0.000	0.000	0.150	0.300	-1.551	0.000	0.000	0.000
PNFLAN	3	3	ug/L	0.717	0.176	0.423	0.000	0.550	0.900	-0.353	0.246	0.062	0.000
PNPYR	3	3	ug/L	0.470	0.113	1.717	0.000	0.400	0.600	-0.773	0.227	1.709	0.000
PNBAA	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	TStd	Trans	Regression Estimates Mean	TStd	R**2
PNNAPH	3	3	ug/L	0.100	104.000	104.000	104.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNACNY	3	3	ug/L	0.010	0.280	0.280	0.280	LN	0.300	0.341	LN	0.300	0.584	0.926
PNACNY	3	3	ug/L	0.010	0.900	0.900	0.900	LN	0.970	0.387	LN	0.970	0.622	0.974
PNFLUO	3	3	ug/L	0.010	0.790	0.790	0.790	LN	0.800	0.080	LN	0.800	0.283	0.986
PNPHEN	3	3	ug/L	0.100	1.720	1.720	1.720	LN	1.770	0.188	LN	1.770	0.434	1.000
PNANTH	3	2	ug/L	0.010	0.150	0.150	0.150	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNFLAN	3	3	ug/L	0.010	0.720	0.720	0.720	LN	0.720	0.061	LN	0.720	0.246	1.000
PNPYR	3	3	ug/L	0.010	0.470	0.470	0.470	LN	0.470	0.052	LN	0.470	0.227	0.795
PNBAA	3	0	ug/L	0.020	0.020	0.010	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000

Loading Estimates: Load=QBAR*CBAR

Parameter Code	Instantaneous Loadings N	ND	Units	Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	X	Trans	Regression Estimates Mean	X
PNNAPH	0	0	g/d	0.000	0.000	35.300	35.300	35.300	N/A	0.000	0.000	N/A	0.000	0.000
PNACNY	0	0	mg/d	0.000	0.000	94.900	94.900	94.900	LN	102.000	0.338	LN	102.000	0.435
PNACNY	0	0	mg/d	0.000	0.000	305.000	305.000	305.000	LN	329.000	0.354	LN	329.000	0.452
PNFLUO	0	0	mg/d	0.000	0.000	268.000	268.000	268.000	LN	271.000	0.279	LN	271.000	0.320
PNPHEN	0	0	mg/d	0.000	0.000	583.000	583.000	583.000	LN	600.000	0.295	LN	600.000	0.372
PNANTH	0	0	mg/d	0.000	0.000	50.900	50.900	50.900	N/A	0.000	0.000	N/A	0.000	0.000
PNFLAN	0	0	mg/d	0.000	0.000	244.000	244.000	244.000	LN	244.000	0.277	LN	244.000	0.309
PNPYR	0	0	mg/d	0.000	0.000	159.000	159.000	159.000	LN	159.000	0.276	LN	159.000	0.304
PNBAA	0	0	mg/d	0.000	0.000	6.780	3.390	0.000	N/A	0.000	0.000	N/A	0.000	0.000

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Concentration Estimates Units	Mean	Confidence Interval		Loading Estimates Units	Mean	Confidence Interval	
PNNAPH	ug/L	104.000#			g/d	35.30#		
PNACNY	ug/L	0.300	0.200	0.440	mg/d	102.00	52.60	198.00
PNACNY	ug/L	0.970	0.630	1.500	mg/d	329.00	164.00	659.00
PNFLUO	ug/L	0.800	0.730	0.880	mg/d	271.00	157.00	468.00
PNPHEN	ug/L	1.770	1.430	2.190	mg/d	600.00	336.00	1070.00
PNANTH	ug/L	0.150#			mg/d	50.90#		
PNFLAN	ug/L	0.720	0.670	0.770	mg/d	244.00	142.00	420.00
PNPYR	ug/L	0.470	0.440	0.500	mg/d	159.00	92.50	273.00
PNBAA	ug/L	NC			mg/d	NC		

NOTE: * Regression estimate used, # Weighted Ave. method

[redacted]

SUMMARY OUTPUT FROM LOADS V2.6 Sept. 1990

Run 1: Concentration file: algo7.dat
Analysis for outfall(s): Algoma SW-1
Mean flow (QBAR): 58400000. L/d Std: 92600000. Skew: 1.88

Discharge file: algo.flo
Number: 1
Kurt: 6.52 Flow points: 12 (LogStd or TStd: 1.996)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
PNCHRY	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNBBFA	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNBKF	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNBAP	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNPERY	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNINP	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNDAHA	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNGHIP	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TPAH	2	2	ug/L	0.040	0.000	0.000	0.000	0.010	0.070	-3.632	0.000	0.000	0.000

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	TStd	Trans	Regression Estimates Mean	TStd	R**2
PNCHRY	3	0	ug/L	0.020	0.020	0.010	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNBBFA	3	0	ug/L	0.050	0.050	0.025	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNBKF	2	0	ug/L	0.050	0.050	0.025	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNBAP	3	0	ug/L	0.050	0.050	0.025	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNPERY	3	0	ug/L	0.050	0.050	0.025	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNINP	3	0	ug/L	0.100	0.100	0.050	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNDAHA	3	0	ug/L	0.200	0.200	0.100	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNGHIP	3	0	ug/L	0.100	0.100	0.050	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
TPAH	2	2	ug/L	0.050	0.040	0.040	0.040	N/A	0.000	0.000	N/A	0.000	0.000	0.000

Loading Estimates: Load=QBAR*CBAR

Parameter Code	N	ND	Units	Instantaneous Loadings Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	X	Trans	Regression Estimates Mean	X
PNCHRY	0	0	g/d	0.000	0.000	1.170	0.580	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNBBFA	0	0	g/d	0.000	0.000	2.920	1.460	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNBKF	0	0	g/d	0.000	0.000	2.920	1.460	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNBAP	0	0	g/d	0.000	0.000	2.920	1.460	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNPERY	0	0	g/d	0.000	0.000	2.920	1.460	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNINP	0	0	g/d	0.000	0.000	5.840	2.920	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNDAHA	0	0	g/d	0.000	0.000	11.700	5.840	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNGHIP	0	0	g/d	0.000	0.000	5.840	2.920	0.000	N/A	0.000	0.000	N/A	0.000	0.000
TPAH	0	0	g/d	0.000	0.000	2.340	2.340	2.340	N/A	0.000	0.000	N/A	0.000	0.000

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Concentration Estimates Units	Mean	Confidence Interval	Loading Estimates Units	Mean	Confidence Interval
PNCHRY	ug/L	NC		g/d	NC	
PNBBFA	ug/L	NC		g/d	NC	
PNBKF	ug/L	NC		g/d	NC	
PNBAP	ug/L	NC		g/d	NC	
PNPERY	ug/L	NC		g/d	NC	
PNINP	ug/L	NC		g/d	NC	
PNDAHA	ug/L	NC		g/d	NC	
PNGHIP	ug/L	NC		g/d	NC	
TPAH	ug/L	0.040#		g/d	2.34#	

NOTE: * Regression estimate used, # Weighted Ave. method

SUMMARY OUTPUT FROM LOADS V2.6 Sept. 1990

Run 2: Concentration file: algo7.dat
Analysis for outfall(s): Algoma SW-2
Discharge file: algo.flo
Number: 1
Mean flow (QBAR): 58400000. L/d Std: 92600000. Skew: 1.88 Kurt: 6.52 Flow points: 12 (LogStd or TStd: 1.996)

Statistical Analysis of Detected Concentrations

Parameter				Raw data statistics				Range		Log(e) Transform Statistics			
Code	N	ND	Units	Mean	Std	Skew	Kurt	Min	Max	Mean	Std	Skew	Kurt
PNCHRY	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNBBFA	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNBKF	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNBAP	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNPERY	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNINP	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNDAHA	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNGHIP	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TPAH	2	2	ug/L	0.035	0.000	0.000	0.000	0.010	0.060	-3.709	0.000	0.000	0.000

Mean Concentration Estimates (CBAR)

Parameter					Weighted Ave. with Cu values				MLE Estimates			Regression Estimates		
Code	N	ND	Units	DL	Cu=DL	Cu=0.5DL	Cu=0	Trans	Mean	TStd	Trans	Mean	TStd	R**2
PNCHRY	3	0	ug/L	0.020	0.020	0.010	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNBBFA	3	0	ug/L	0.050	0.050	0.025	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNBKF	2	0	ug/L	0.050	0.050	0.025	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNBAP	3	0	ug/L	0.050	0.050	0.025	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNPERY	3	0	ug/L	0.050	0.050	0.025	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNINP	3	0	ug/L	0.100	0.100	0.050	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNDAHA	3	0	ug/L	0.200	0.200	0.100	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNGHIP	3	0	ug/L	0.100	0.100	0.050	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
TPAH	2	2	ug/L	0.050	0.035	0.035	0.035	N/A	0.000	0.000	N/A	0.000	0.000	0.000

Loading Estimates: Load=QBAR*CBAR

Parameter	Instantaneous Loadings					Weighted Ave. with Cu values				MLE Estimates			Regression Estimates	
Code	N	ND	Units	Mean	TStd	Cu=DL	Cu=0.5DL	Cu=0	Trans	Mean	X	Trans	Mean	X
PNCHRY	0	0	g/d	0.000	0.000	1.170	0.580	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNBBFA	0	0	g/d	0.000	0.000	2.920	1.460	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNBKF	0	0	g/d	0.000	0.000	2.920	1.460	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNBAP	0	0	g/d	0.000	0.000	2.920	1.460	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNPERY	0	0	g/d	0.000	0.000	2.920	1.460	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNINP	0	0	g/d	0.000	0.000	5.840	2.920	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNDAHA	0	0	g/d	0.000	0.000	11.700	5.840	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNGHIP	0	0	g/d	0.000	0.000	5.840	2.920	0.000	N/A	0.000	0.000	N/A	0.000	0.000
TPAH	0	0	g/d	0.000	0.000	2.040	2.040	2.040	N/A	0.000	0.000	N/A	0.000	0.000

Summary of Mean Concentration and Total Loading Estimates

Parameter	Concentration Estimates			Loading Estimates		
Code	Units	Mean	Confidence Interval	Units	Mean	Confidence Interval
PNCHRY	ug/L	NC		g/d	NC	
PNBBFA	ug/L	NC		g/d	NC	
PNBKF	ug/L	NC		g/d	NC	
PNBAP	ug/L	NC		g/d	NC	
PNPERY	ug/L	NC		g/d	NC	
PNINP	ug/L	NC		g/d	NC	
PNDAHA	ug/L	NC		g/d	NC	
PNGHIP	ug/L	NC		g/d	NC	
TPAH	ug/L	0.035#		g/d	2.04#	

NOTE: * Regression estimate used, # Weighted Ave. method

SUMMARY OUTPUT FROM LOADS V2.6 Sept. 1990

Run 1: Concentration file: algo7.dat
Analysis for outfall(s): Algoma SW-3
Discharge file: algo.flo
Number: 1
Mean flow (QBAR): 26300000. L/d Std: 20400000. Skew: 1.32 Kurt: 4.71 Flow points: 12 (LogStd or TStd: 0.795)

Statistical Analysis of Detected Concentrations

Parameter Code	N	ND	Units	Raw data statistics Mean	Std	Skew	Kurt	Range Min	Max	Log(e) Transform Statistics Mean	Std	Skew	Kurt
PNCHRY	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNBBFA	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNBKF	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNBAP	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNPERY	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNINP	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNDAHA	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNGHIP	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TPAH	1	1	ug/L	0.500	0.000	0.000	0.000	0.500	0.500	-0.693	0.000	0.000	0.000

Mean Concentration Estimates (CBAR)

Parameter Code	N	ND	Units	DL	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans.	MLE Estimates Mean	TStd	Trans	Regression Estimates Mean	TStd	R**2
PNCHRY	2	0	ug/L	0.020	0.020	0.010	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNBBFA	2	0	ug/L	0.050	0.050	0.025	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNBKF	2	0	ug/L	0.050	0.050	0.025	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNBAP	2	0	ug/L	0.050	0.050	0.025	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNPERY	2	0	ug/L	0.050	0.050	0.025	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNINP	2	0	ug/L	0.100	0.100	0.050	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNDAHA	2	0	ug/L	0.200	0.200	0.100	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNGHIP	2	0	ug/L	0.100	0.100	0.050	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
TPAH	1	1	ug/L	0.050	0.500	0.500	0.500	N/A	0.000	0.000	N/A	0.000	0.000	0.000

Loading Estimates: Load=QBAR*CBAR

Parameter Code	N	ND	Units	Instantaneous Loadings Mean	TStd	Weighted Ave. with Cu values Cu=DL	Cu=0.5DL	Cu=0	Trans	MLE Estimates Mean	X	Regression Estimates Trans	Mean	X
PNCHRY	0	0	mg/d	0.000	0.000	526.000	263.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNBBFA	0	0	g/d	0.000	0.000	1.320	0.660	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNBKF	0	0	g/d	0.000	0.000	1.320	0.660	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNBAP	0	0	g/d	0.000	0.000	1.320	0.660	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNPERY	0	0	g/d	0.000	0.000	1.320	0.660	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNINP	0	0	g/d	0.000	0.000	2.630	1.320	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNDAHA	0	0	g/d	0.000	0.000	5.260	2.630	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNGHIP	0	0	g/d	0.000	0.000	2.630	1.320	0.000	N/A	0.000	0.000	N/A	0.000	0.000
TPAH	0	0	g/d	0.000	0.000	13.100	13.100	13.100	N/A	0.000	0.000	N/A	0.000	0.000

Summary of Mean Concentration and Total Loading Estimates

Parameter Code	Concentration Estimates Units	Mean	Confidence Interval	Loading Estimates Units	Mean	Confidence Interval
PNCHRY	ug/L	NC		mg/d	NC	
PNBBFA	ug/L	NC		g/d	NC	
PNBKF	ug/L	NC		g/d	NC	
PNBAP	ug/L	NC		g/d	NC	
PNPERY	ug/L	NC		g/d	NC	
PNINP	ug/L	NC		g/d	NC	
PNDAHA	ug/L	NC		g/d	NC	
PNGHIP	ug/L	NC		g/d	NC	
TPAH	ug/L	0.500#		g/d	13.10#	

NOTE: * Regression estimate used, # Weighted Ave. method

SUMMARY OUTPUT FROM LOADS V2.6 Sept. 1990

Run 5: Concentration file: algo7.dat Discharge file: algo.flo
Analysis for outfall(s): Algoma SW-4 Number: 1
Mean flow (QBAR): 88600. L/d Std: 105000. Skew: 1.42 Kurt: 6.51 Flow points: 8 (LogStd or TStd: 1.730)

Statistical Analysis of Detected Concentrations

Parameter				Raw data statistics				Range		Log(e) Transform Statistics			
Code	N	ND	Units	Mean	Std	Skew	Kurt	Min	Max	Mean	Std	Skew	Kurt
PNCHRY	2	2	ug/L	0.100	0.000	0.000	0.000	0.100	0.100	-2.303	0.000	0.000	0.000
PNBBFA	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNBKF	1	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNBAP	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNPERY	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNINP	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNDAHA	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNGHIP	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TPAH	2	2	ug/L	459.600	0.000	0.000	0.000	209.200	710.000	5.954	0.000	0.000	0.000

Mean Concentration Estimates (CBAR)

Parameter					Weighted Ave. with Cu values			MLE Estimates				Regression Estimates		
Code	N	ND	Units	DL	Cu=DL	Cu=0.5DL	Cu=0	Trans	Mean	TStd	Trans	Mean	TStd	R**2
PNCHRY	2	2	ug/L	0.020	0.100	0.100	0.100	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNBBFA	2	0	ug/L	0.050	0.050	0.025	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNBKF	1	0	ug/L	0.050	0.050	0.025	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNBAP	2	0	ug/L	0.050	0.050	0.025	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNPERY	2	0	ug/L	0.050	0.050	0.025	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNINP	2	0	ug/L	0.100	0.100	0.050	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNDAHA	2	0	ug/L	0.200	0.200	0.100	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNGHIP	2	0	ug/L	0.100	0.100	0.050	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
TPAH	2	2	ug/L	0.050	460.000	460.000	460.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000

Loading Estimates: Load=QBAR*CBAR

Parameter				Instantaneous Loadings		Weighted Ave. with Cu values			MLE Estimates			Regression Estimates		
Code	N	ND	Units	Mean	TStd	Cu=DL	Cu=0.5DL	Cu=0	Trans	Mean	X	Trans	Mean	X
PNCHRY	0	0	mg/d	0.000	0.000	8.860	8.860	8.860	N/A	0.000	0.000	N/A	0.000	0.000
PNBBFA	0	0	mg/d	0.000	0.000	4.430	2.210	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNBKF	0	0	mg/d	0.000	0.000	4.430	2.210	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNBAP	0	0	mg/d	0.000	0.000	4.430	2.210	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNPERY	0	0	mg/d	0.000	0.000	4.430	2.210	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNINP	0	0	mg/d	0.000	0.000	8.860	4.430	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNDAHA	0	0	mg/d	0.000	0.000	17.700	8.860	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNGHIP	0	0	mg/d	0.000	0.000	8.860	4.430	0.000	N/A	0.000	0.000	N/A	0.000	0.000
TPAH	0	0	g/d	0.000	0.000	40.800	40.800	40.800	N/A	0.000	0.000	N/A	0.000	0.000

Summary of Mean Concentration and Total Loading Estimates

Parameter	Concentration Estimates			Loading Estimates		
Code	Units	Mean	Confidence Interval	Units	Mean	Confidence Interval
PNCHRY	ug/L	0.100#		mg/d	8.86#	
PNBBFA	ug/L	NC		mg/d	NC	
PNBKF	ug/L	NC		mg/d	NC	
PNBAP	ug/L	NC		mg/d	NC	
PNPERY	ug/L	NC		mg/d	NC	
PNINP	ug/L	NC		mg/d	NC	
PNDAHA	ug/L	NC		mg/d	NC	
PNGHIP	ug/L	NC		mg/d	NC	
TPAH	ug/L	460.000#		g/d	40.80#	

NOTE: * Regression estimate used, # Weighted Ave. method

SUMMARY OUTPUT FROM LOADS V2.6 Sept. 1990

Run 6: Concentration file: algo7.dat Discharge file: algo.flo
Analysis for outfall(s): Algoma SW-5 Number: 1
Mean flow (QBAR): 339000. L/d Std: 144000. Skew: -1.33 Kurt: 10.23 Flow points: 5 (LogStd or TStd: 0.614)

Statistical Analysis of Detected Concentrations

Parameter				Raw data statistics				Range		Log(e) Transform Statistics			
Code	N	ND	Units	Mean	Std	Skew	Kurt	Min	Max	Mean	Std	Skew	Kurt
PNCHRY	3	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNBBFA	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNBKF	1	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNBAP	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNPERY	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNINP	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNDAHA	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PNGHIP	2	0	ug/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TPAH	2	2	ug/L	160.400	0.000	0.000	0.000	46.100	274.700	4.723	0.000	0.000	0.000

Mean Concentration Estimates (CBAR)

Parameter					Weighted Ave. with Cu values				MLE Estimates			Regression Estimates		
Code	N	ND	Units	DL	Cu=DL	Cu=0.5DL	Cu=0	Trans	Mean	TStd	Trans	Mean	TStd	R**2
PNCHRY	3	0	ug/L	0.020	0.020	0.010	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNBBFA	2	0	ug/L	0.050	0.050	0.025	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNBKF	1	0	ug/L	0.050	0.050	0.025	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNBAP	2	0	ug/L	0.050	0.050	0.025	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNPERY	2	0	ug/L	0.050	0.050	0.025	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNINP	2	0	ug/L	0.100	0.100	0.050	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNDAHA	2	0	ug/L	0.200	0.200	0.100	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
PNGHIP	2	0	ug/L	0.100	0.100	0.050	0.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000
TPAH	2	2	ug/L	0.050	160.000	160.000	160.000	N/A	0.000	0.000	N/A	0.000	0.000	0.000

Loading Estimates: Load=QBAR*CBAR

Parameter			Instantaneous Loadings			Weighted Ave. with Cu values			MLE Estimates			Regression Estimates		
Code	N	ND	Units	Mean	TStd	Cu=DL	Cu=0.5DL	Cu=0	Trans	Mean	X	Trans	Mean	X
PNCHRY	0	0	mg/d	0.000	0.000	6.780	3.390	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNBBFA	0	0	mg/d	0.000	0.000	17.000	8.480	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNBKF	0	0	mg/d	0.000	0.000	17.000	8.480	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNBAP	0	0	mg/d	0.000	0.000	17.000	8.480	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNPERY	0	0	mg/d	0.000	0.000	17.000	8.480	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNINP	0	0	mg/d	0.000	0.000	33.900	17.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNDAHA	0	0	mg/d	0.000	0.000	67.800	33.900	0.000	N/A	0.000	0.000	N/A	0.000	0.000
PNGHIP	0	0	mg/d	0.000	0.000	33.900	17.000	0.000	N/A	0.000	0.000	N/A	0.000	0.000
TPAH	0	0	g/d	0.000	0.000	54.200	54.200	54.200	N/A	0.000	0.000	N/A	0.000	0.000

Summary of Mean Concentration and Total Loading Estimates

Parameter		Concentration Estimates			Loading Estimates		
Code	Units	Mean	Confidence Interval	Units	Mean	Confidence Interval
PNCHRY	ug/L	NC		mg/d	NC	
PNBBFA	ug/L	NC		mg/d	NC	
PNBKF	ug/L	NC		mg/d	NC	
PNBAP	ug/L	NC		mg/d	NC	
PNPERY	ug/L	NC		mg/d	NC	
PNINP	ug/L	NC		mg/d	NC	
PNDAHA	ug/L	NC		mg/d	NC	
PNGHIP	ug/L	NC		mg/d	NC	
TPAH	ug/L	160.000#		g/d	54.20#	

NOTE: * Regression estimate used, # Weighted Ave. method